

R42



VAKGROEP
WATERBOUWKUNDE
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GELDIGHEIDSGBIEDEN
VAN ENIGE
SEDIMENTTRANSPORT FORMULES
FIGUREN

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FIGUREN

Delft, juni 1978

R. Langen

HOOFDSTUK 2

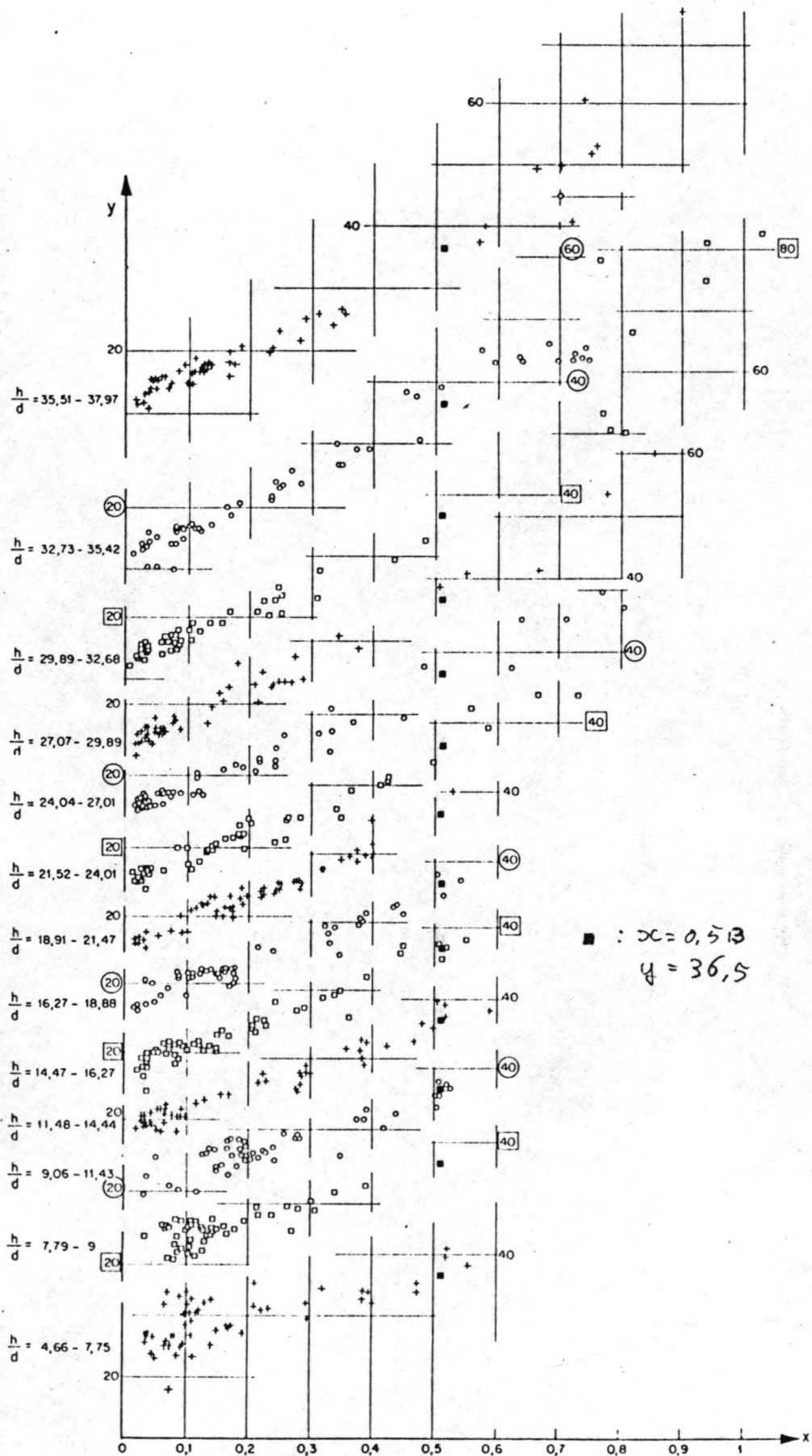


Fig. 2.2.1 Relatie tussen $x = \left(\frac{G}{\rho' \Delta h^3}\right)^{\frac{1}{3}}$ en $y = \frac{v}{\Delta h}$ voor konstante h/D , volgens Rottner, 1959.

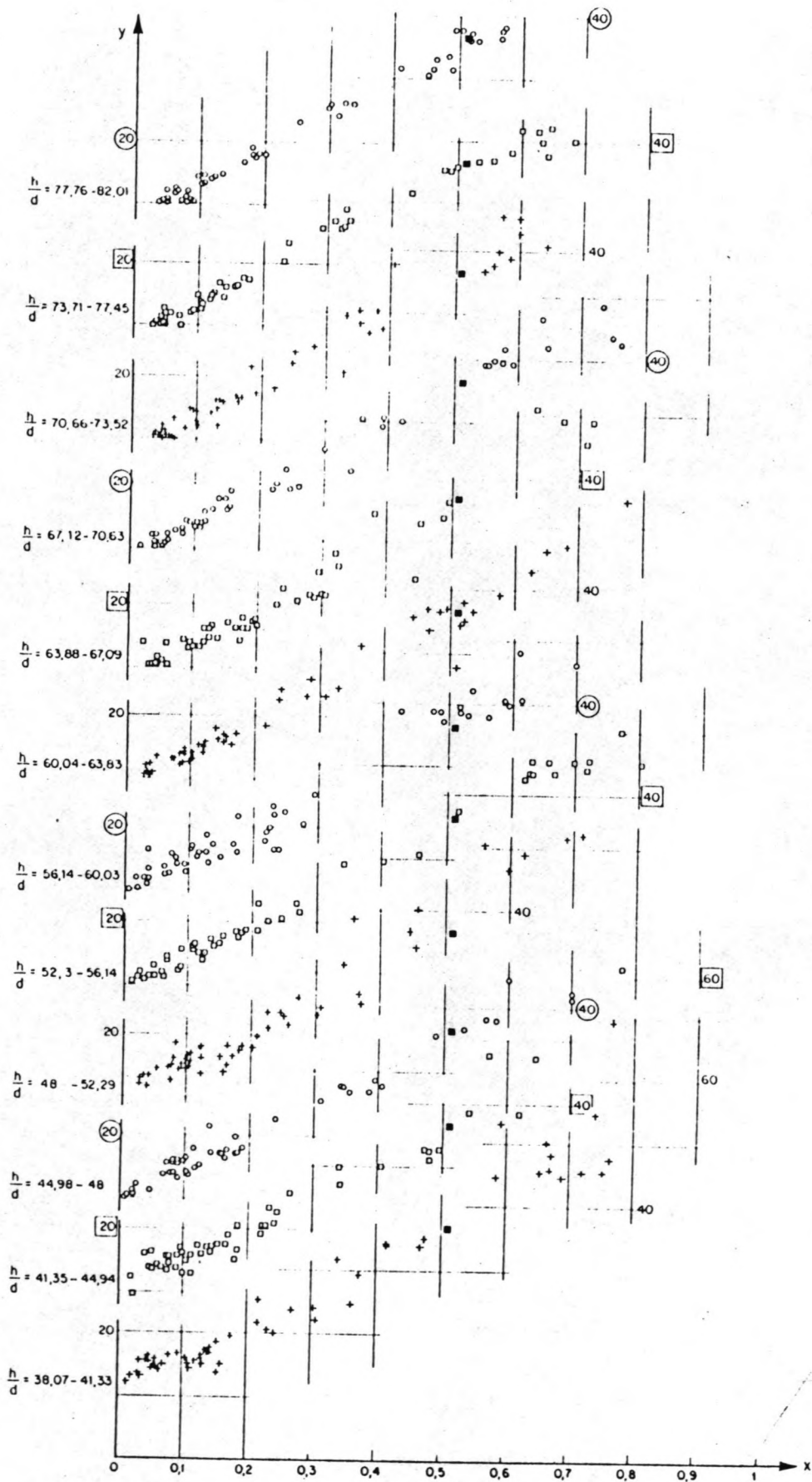


Fig. 2.2.1 Vervolg.

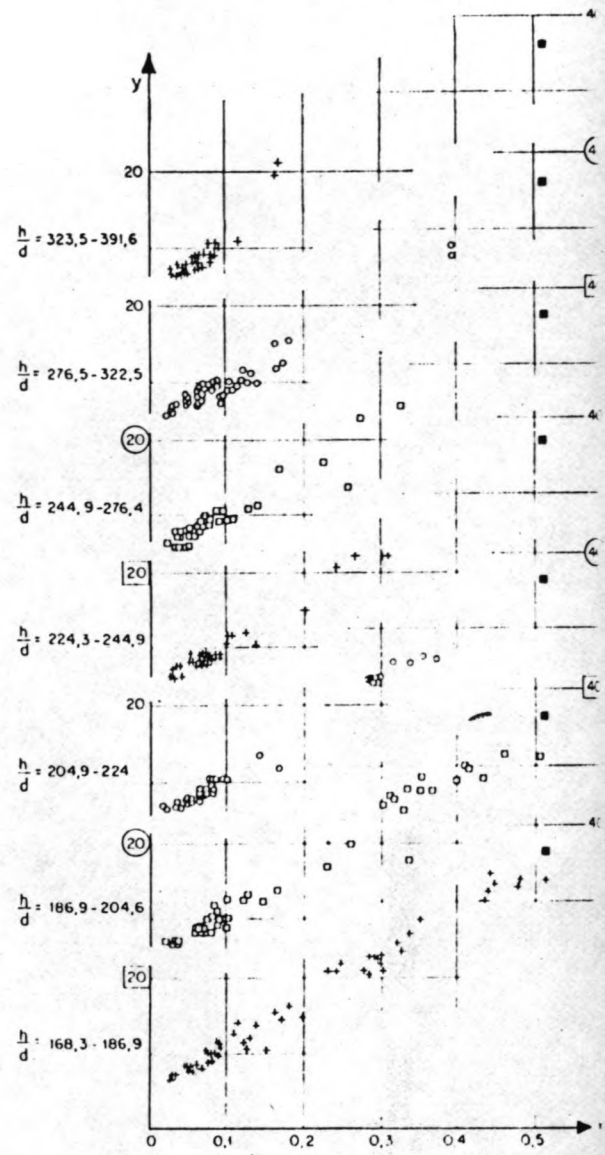
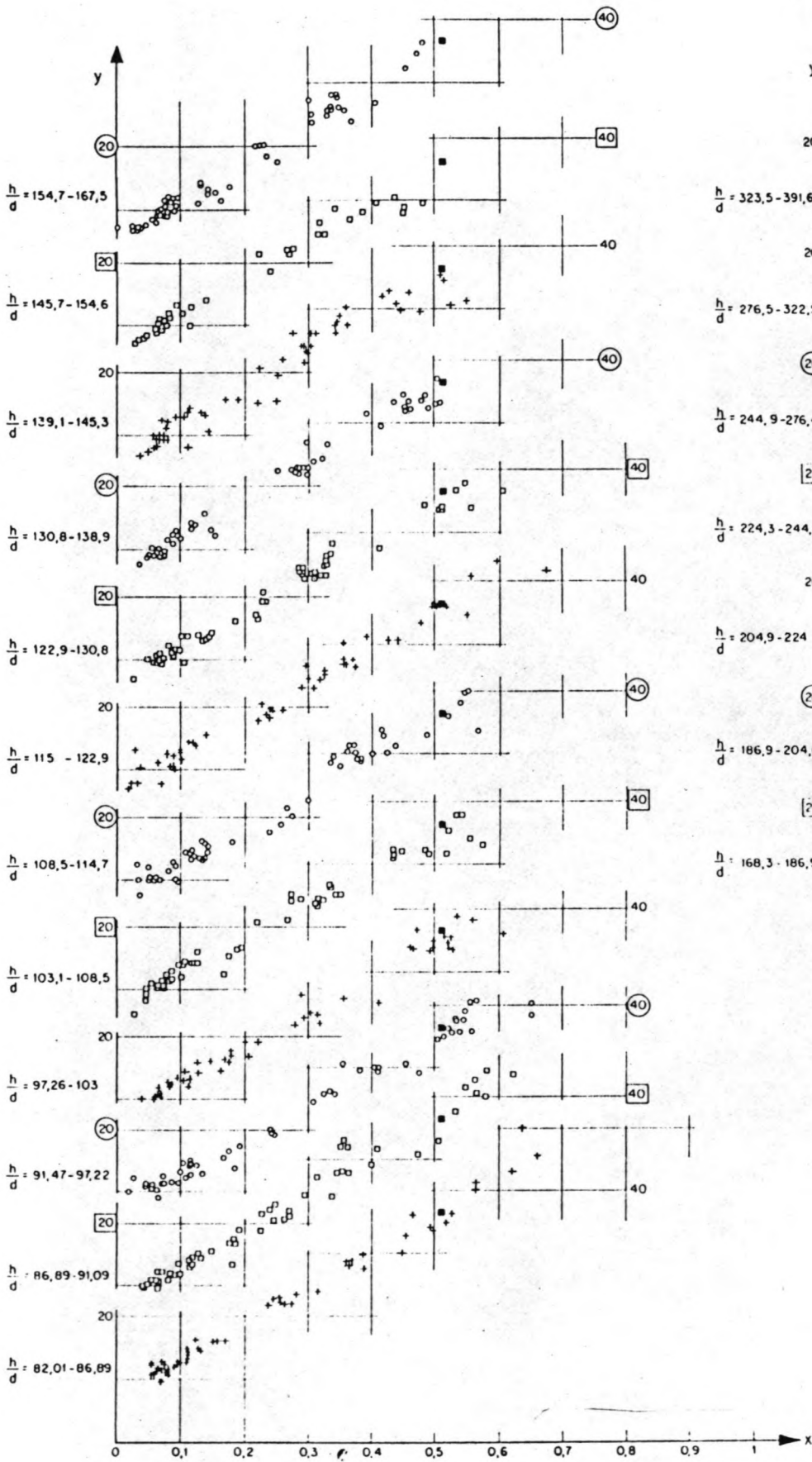


Fig. 2.2.1 Vervolg.

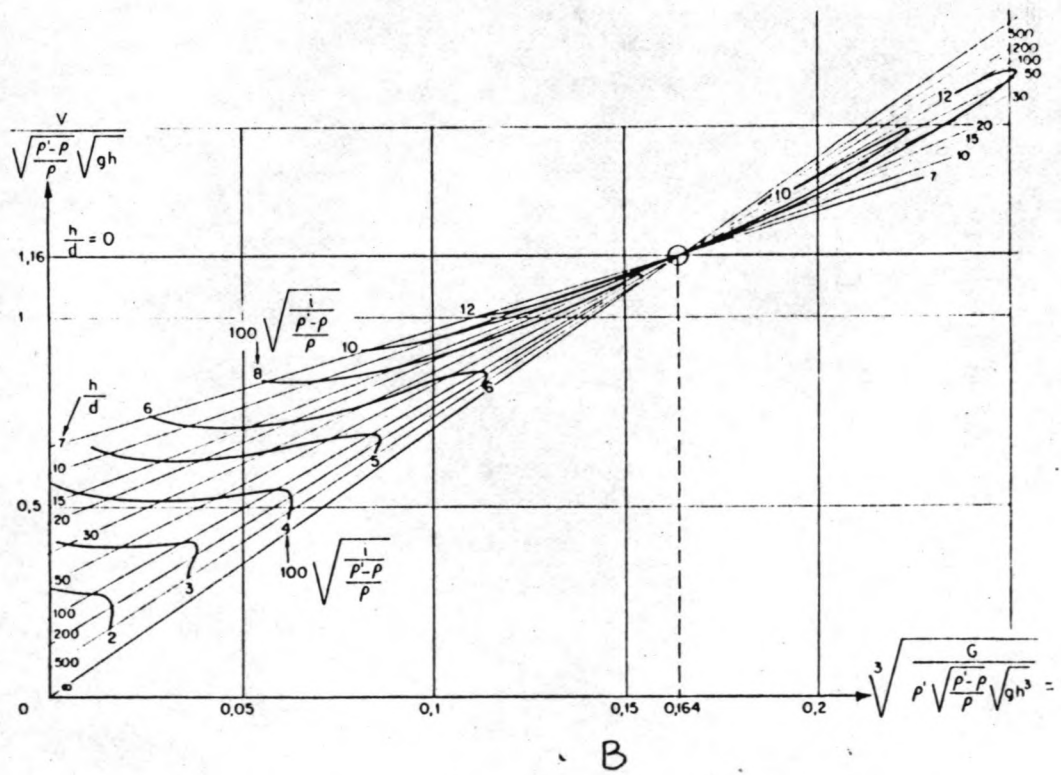
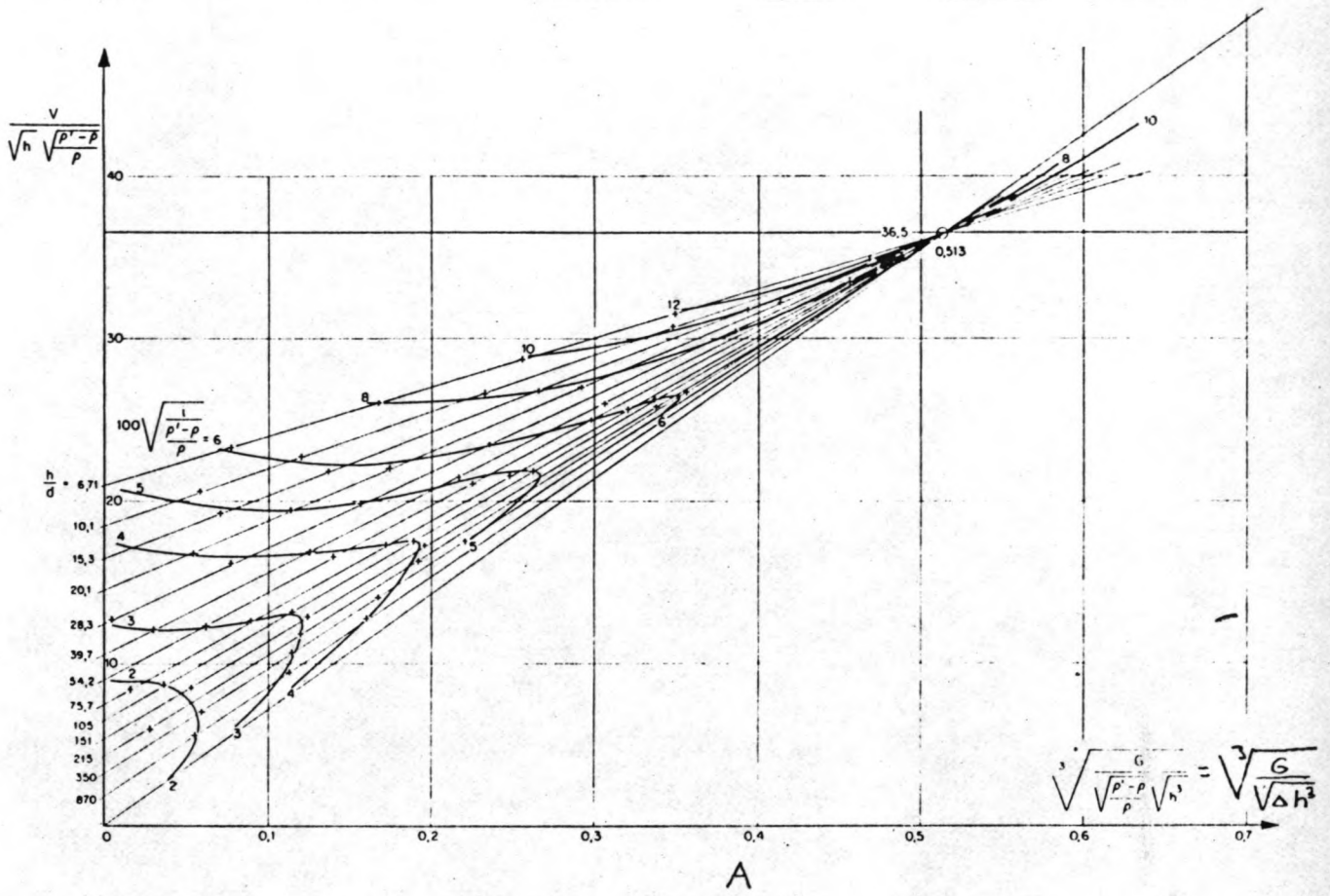


Fig. 2.2.2 Grafische weergave van de sedimenttransport formule van Rottner.

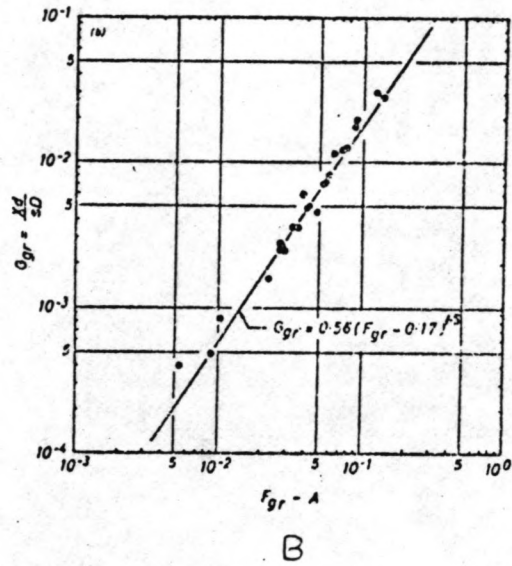
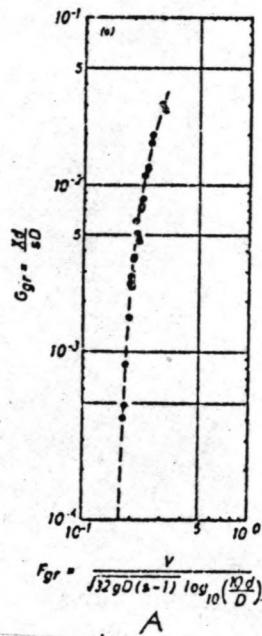


Fig. 2.3.1 Relatie tussen F_{gr} en G_{gr} voor $D = 1,35$ mm, volgens Ackers en White, 1973.

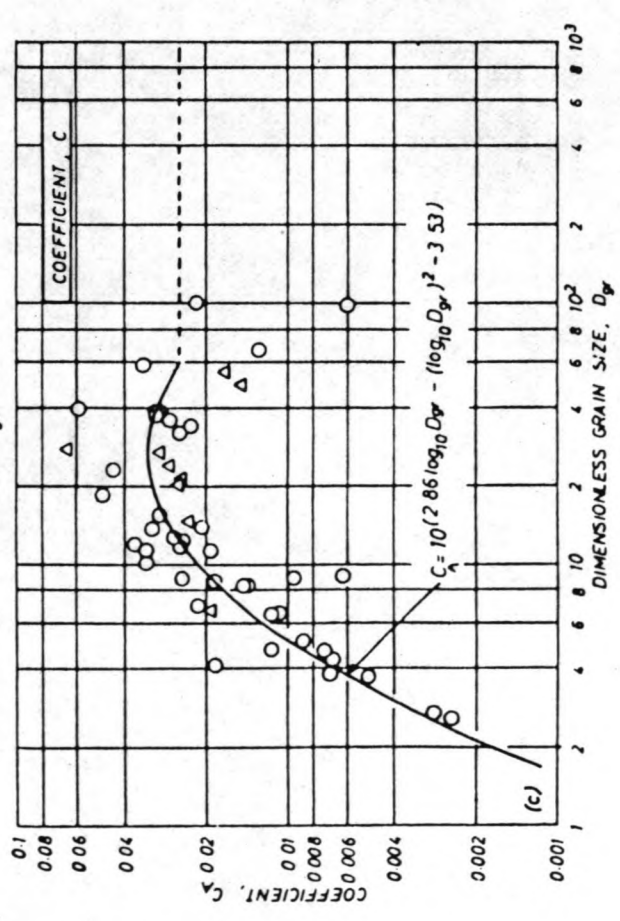
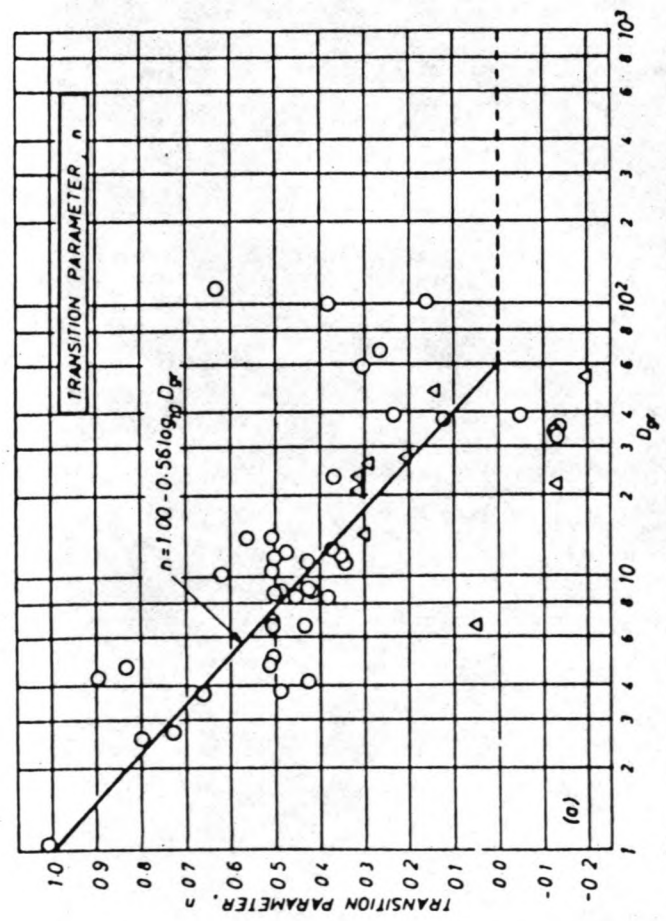
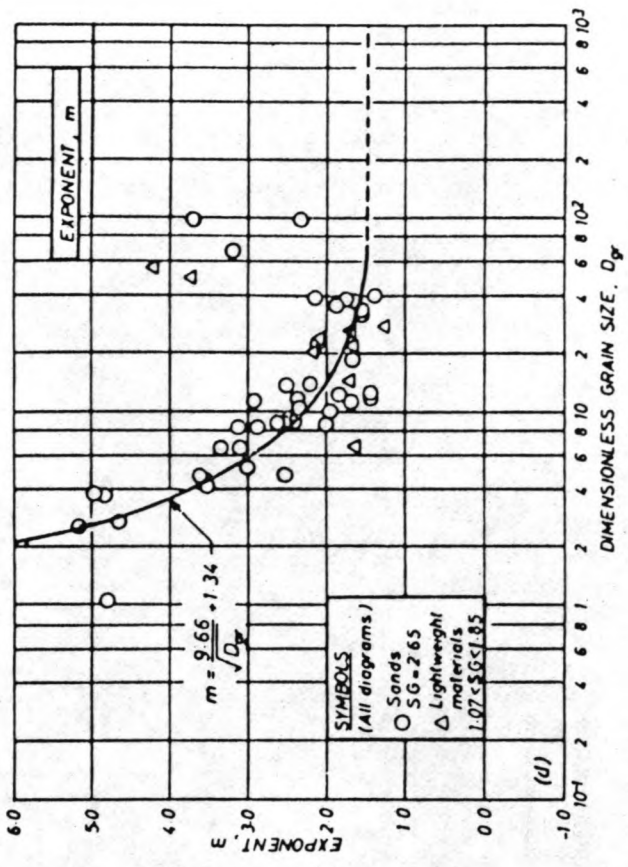
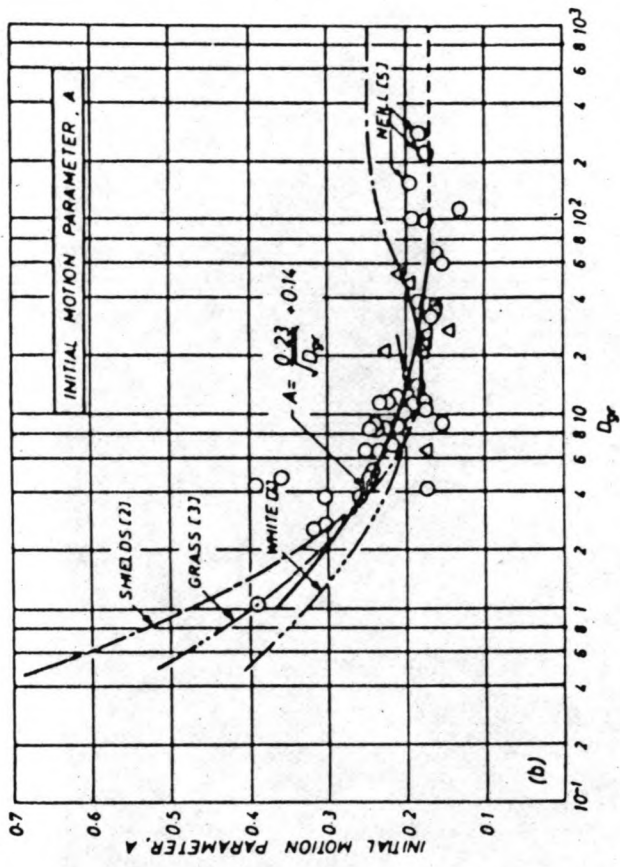


Fig. 2.3.2 Het verloop van A, C_a, m en n met D_{gr}, volgens Ackers en White.

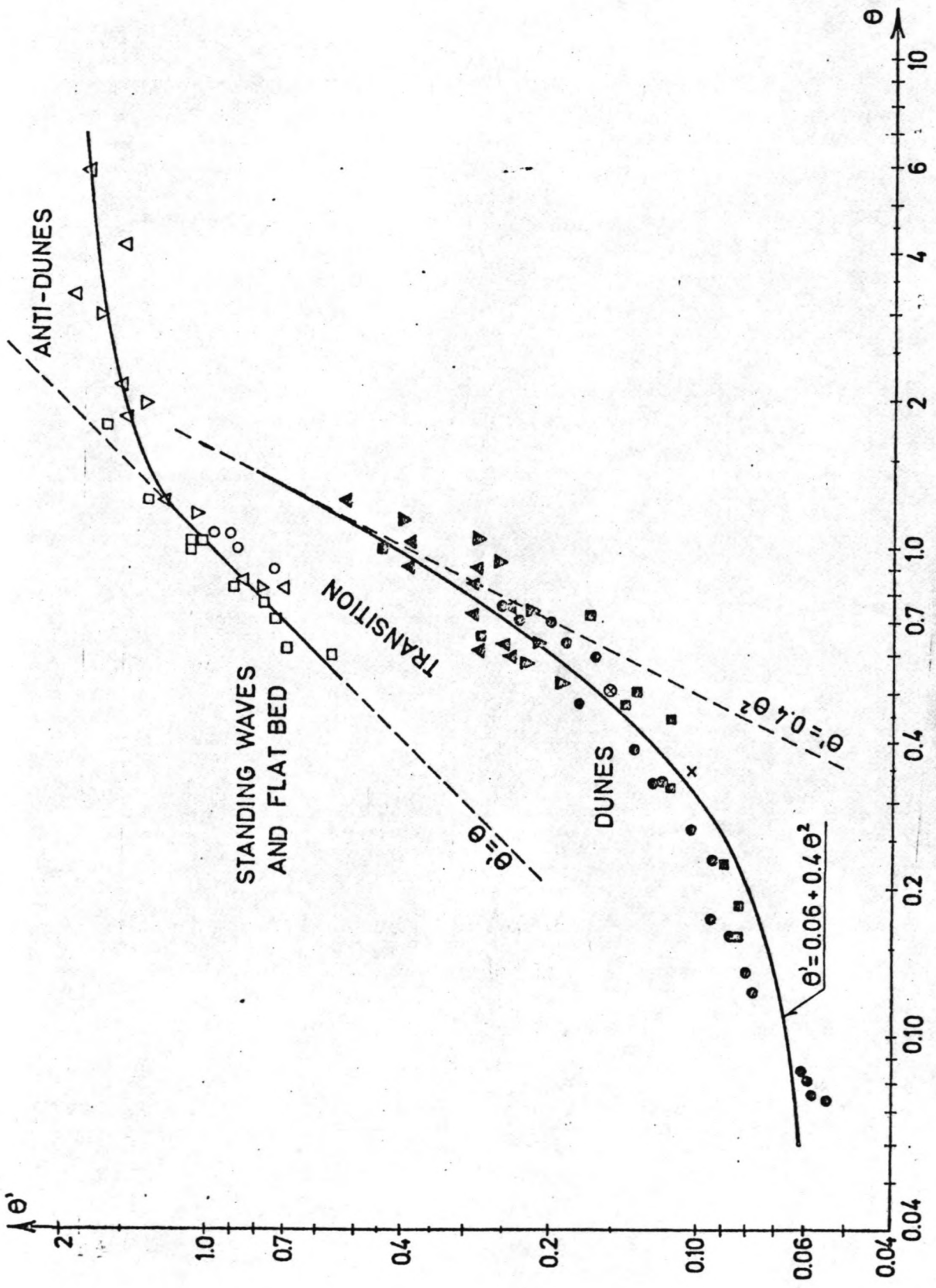


FIG. 2.4.1 RELATIE TUSSEN θ EN θ' , VOLGENS ENGELUND EN HANSEN (1967).

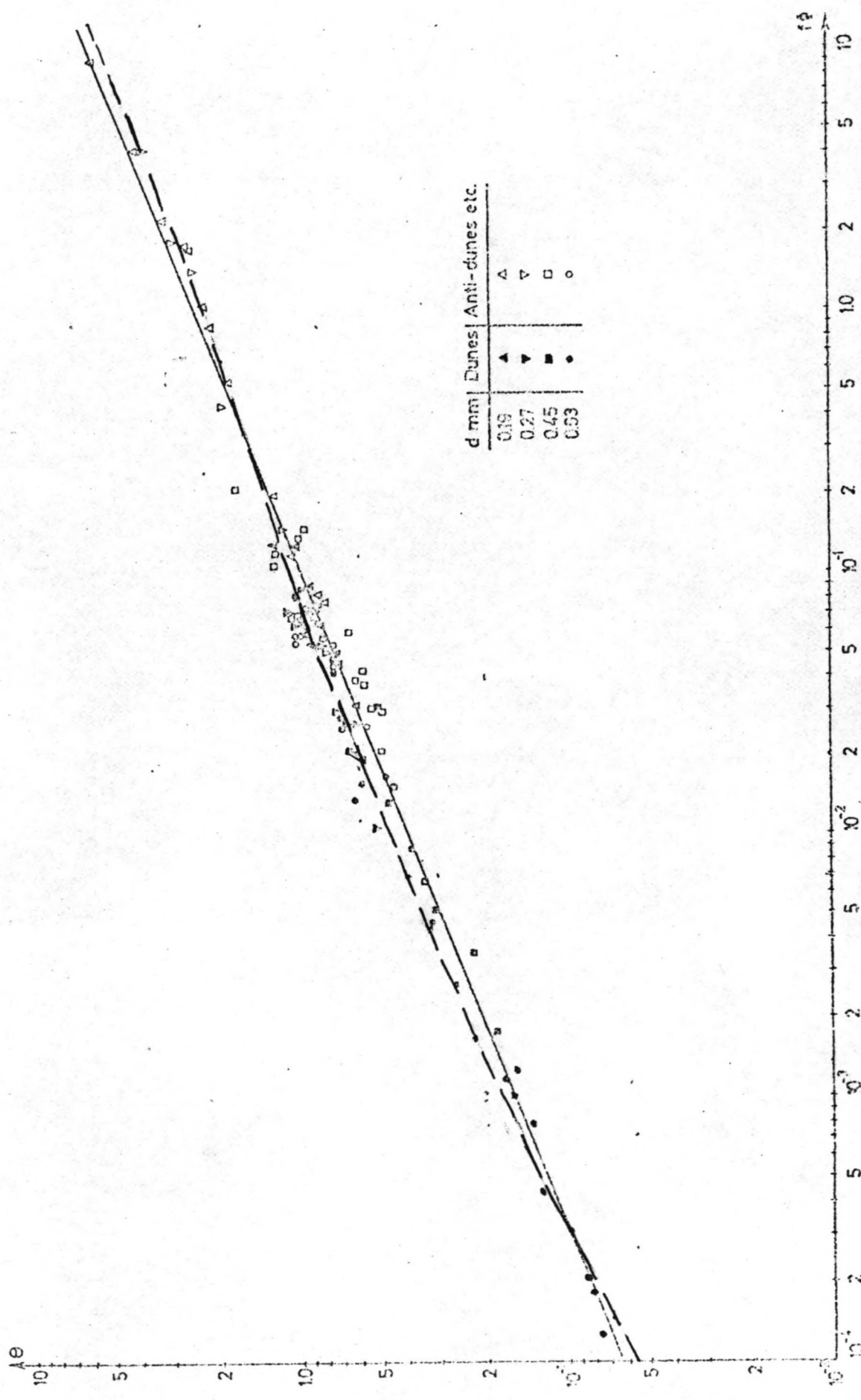


FIG. 2.4.2 RELATIE TUSSEN θ_m $f\Phi$ VOLGENS ENGELUND EN HANSEN (1967)

Y

HOOFDSTUK 3

$X \left(= \frac{T}{\lg \frac{D}{D_0}} \right)$ ALS FUNCTIE VAN $Y' \left(= \frac{dD}{dR} \right)$ VOOR

ALLE BRUIKBARE WAARNEMINGEN VAN COOPER EN PETERSON.

Δ : MEETPUNTEN

REGRESSIE LYN (1^{ste} HOOFDGRAD) $Y = 0.017 + 0.25 X$

GEVONDEN LYN (KERSSENS) $Y = 1.85 \cdot 10^{-1} + 0.15 X^2$

STROOMPARAMETER $Y' = \frac{dD}{dR}$

TRANSPORTPARAMETER $X^2 = \frac{T^2}{0.00193 D^3}$

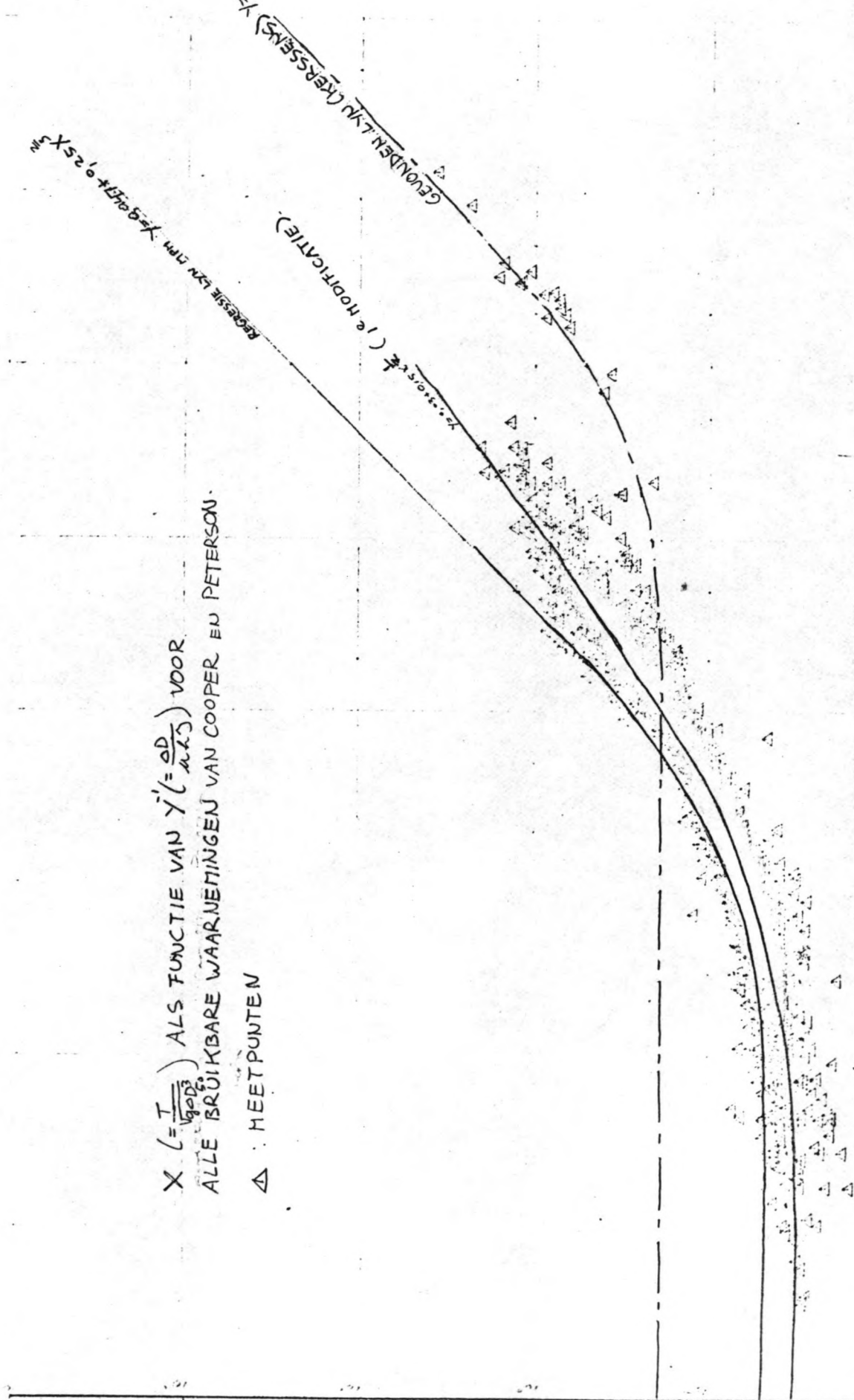


FIG. 3.1

Fig. 3.2 t/m 3.17 : Relatie tussen $X^{2/3} = \left(\frac{\tau}{\sqrt{g \Delta \bar{D}^3}} \right)^{2/3}$ en $Y^{-1} = \left(\frac{\mu R_f J}{\Delta \bar{D}} \right)$
volgens Meyer Peter Müller en de 2^e modificatie.

FIG. 3.2

INTERVAL NR 1 : D50 ≤ 0,1 mm

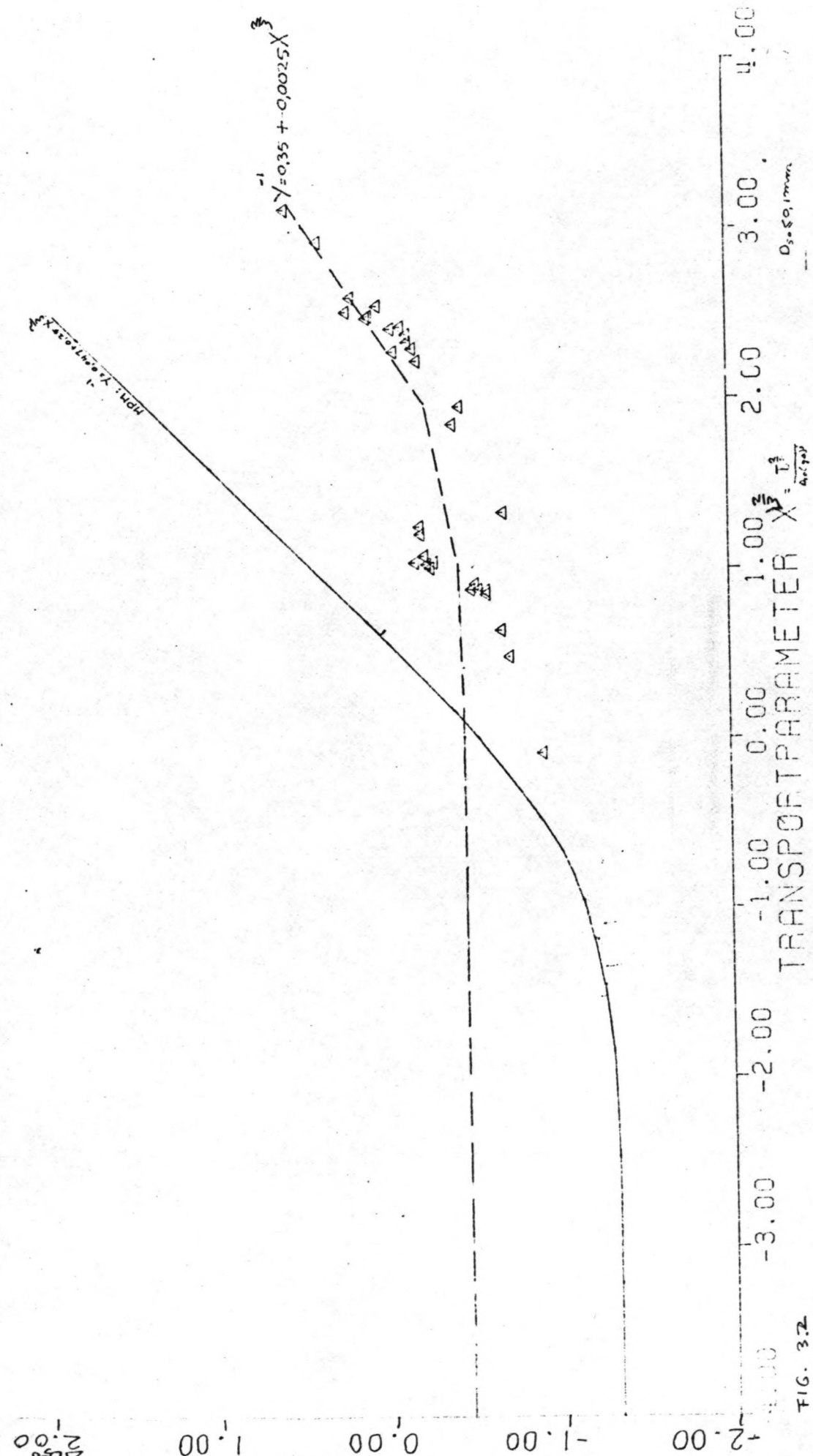


FIG. 3.2

INTERVAL NR 2: $0.1 < B_{50} \leq 0.2$

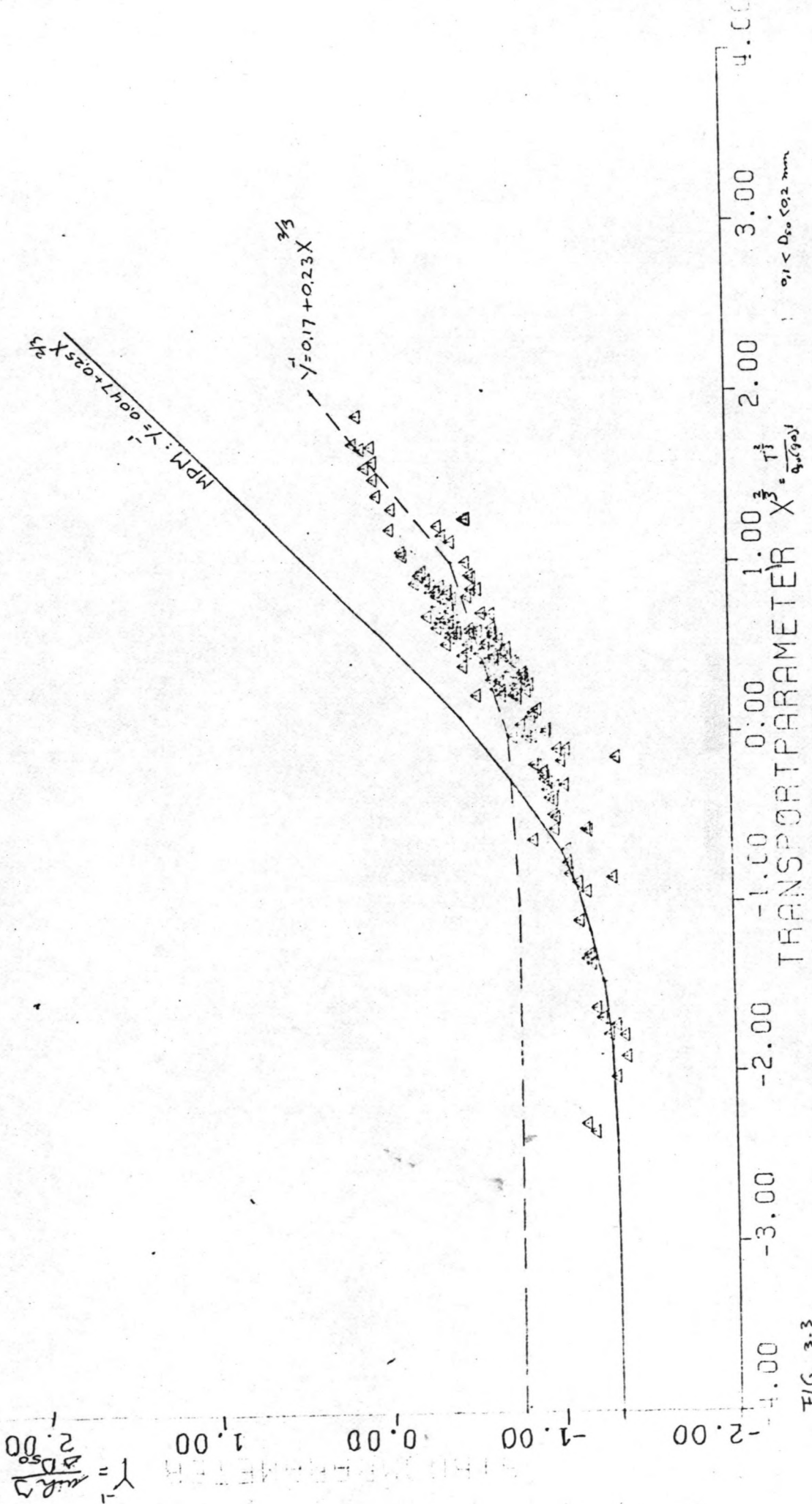


FIG. 3.3

FIG. 3.4

INTERVAL NR 3 : $0,2 < D_{50} \leq 0,3$.

$\frac{dD_{50}}{dX} = Y$

MPM: $Y = 0,047 + 0,25 X^{2/3}$

$Y = 0,11 + 0,0344 X^{2/3}$

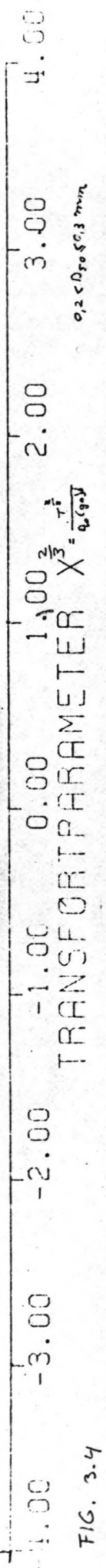


FIG. 3.4

INTERVAL NR 4: $93 < D_{50} \leq 0.4 \text{ mm}$

STROMPARAMETER $Y = \frac{D_{50}}{D_{90}}$

MPM: $Y = 0.001 + 0.25 X^{2/3}$

GEKORRIGERD: $Y = 0.083 + 0.067 X^{2/3}$
 $Y = 0.17 + 0.050 X^{2/3}$

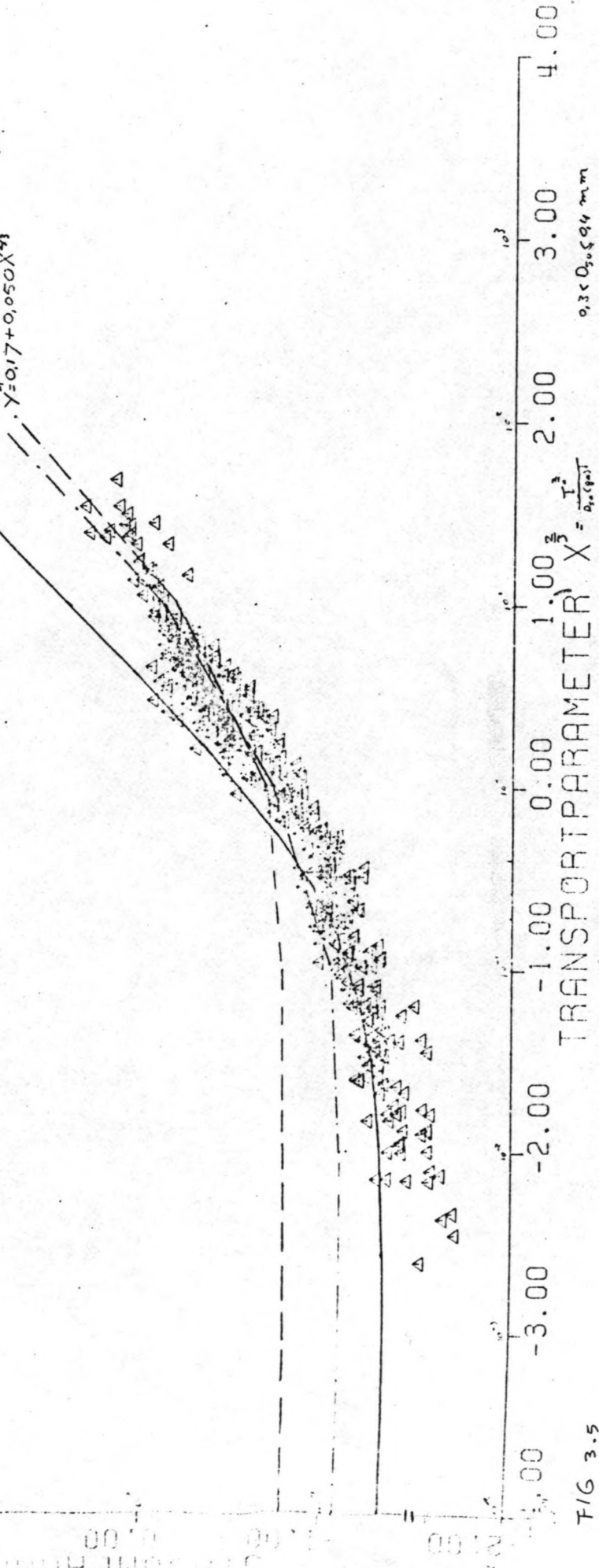


FIG 3.5

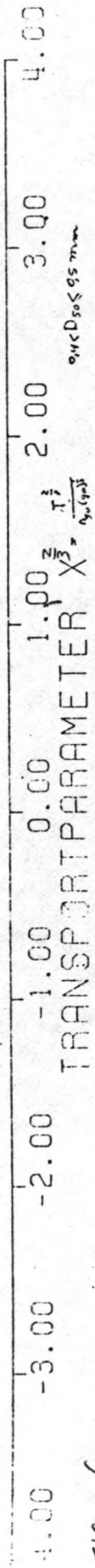
FIG 3.6

INTERVAL NR 5: $0.4 < D_{50} \leq 0.5 \text{ mm}$

$\bar{Y} = \frac{\sum Y_i}{n}$

$\text{MPM: } \bar{Y} = 0.097 + 0.25 X^{2/3}$

$\bar{Y} = 0.056 + 0.098 X^{2/3}$



$0.1 < D_{50} \leq 0.5 \text{ mm}$

FIG. 3.6

FIG. 3.7

$$Y = \frac{u_{*R} D_{50}}{v} = 1$$

INTERVAL NR 6 : $0.5 < D_{50} \leq 0.6 \text{ mm}$.

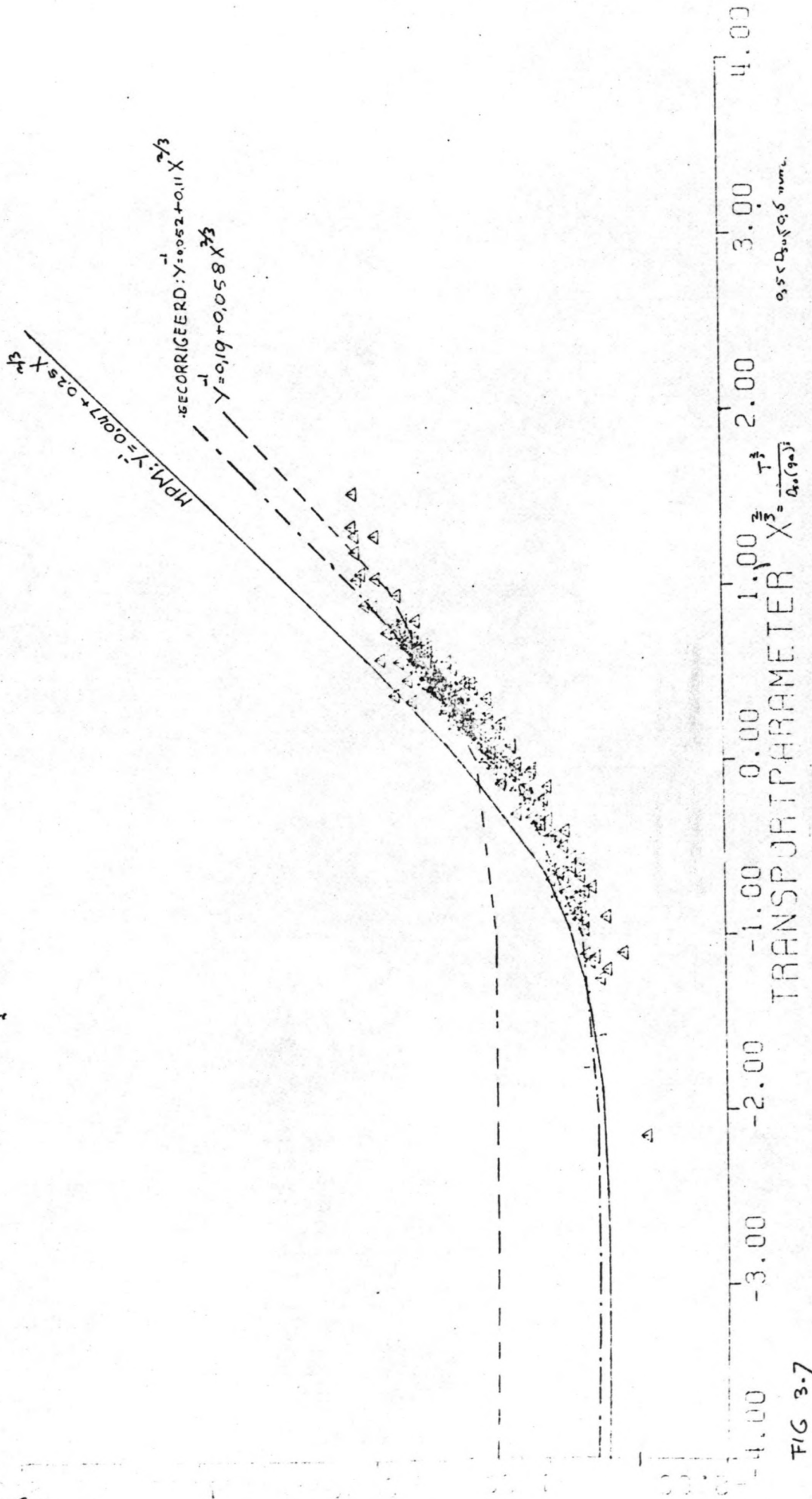


FIG 3.7

FIG 3.8

INTERVAL NR7: $0.6 < D_{50} \leq 0.8 \text{ mm}$

$Y = \frac{K \cdot D_{50}^2}{\dots}$

$MPM \ Y = 0.017 + 0.25 X^{2/3}$

$Y = 0.049 + 0.12 X^{2/3}$

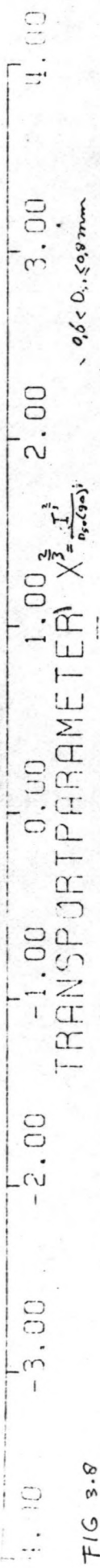


FIG 3.8

STROOMPARAMETER $Y^{-1} = \frac{u_{*0}}{gD_{50}}$

INTERVAL NR 8: $0.8 < D_{50} \leq 1.0$ mm

MPM: $Y^{-1} = 0.07 + 0.35 X^{2/3}$

$Y^{-1} = 0.039 + 0.14 X^{2/3}$

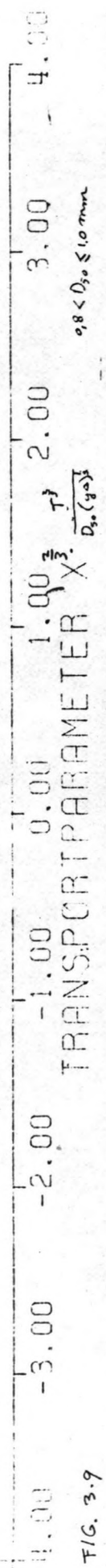


FIG. 3.9

INTERVAL NR 9 : 1,0 < D₅₀ ≤ 1,2 mm

$\frac{1}{2} X \sqrt{0,047 + 0,25 X}$

$Y = 0,034 + 0,18 X^{2/3}$

STROMPARAMETER $Y = \frac{u R D}{0,65}$

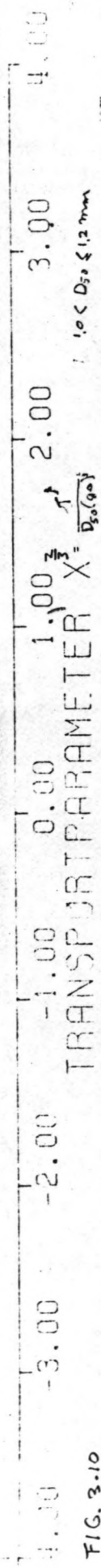


FIG. 3.10

STROOH PARAMETER $Y^{-1} = \frac{uR}{\Delta D_{50}}$

INTERVAL NR 10: $1,2 < D_{50} \leq 1,6 \text{ mm}$

$MPH: Y^{-1} = 0,007 + 0,25 X^{2/3}$

$Y^{-1} = 0,031 + 0,25 X^{2/3}$

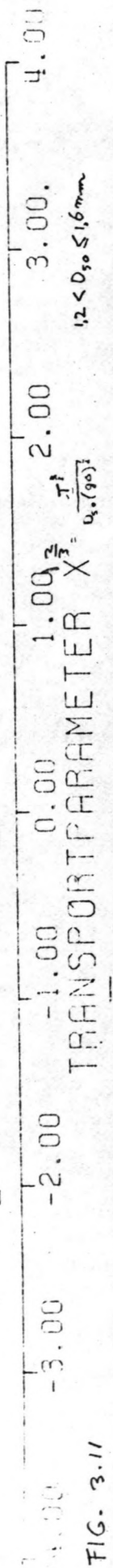


FIG. 3.11

INTERVAL NR 11: $1,6 < D_{50} \leq 2 \text{ mm}$

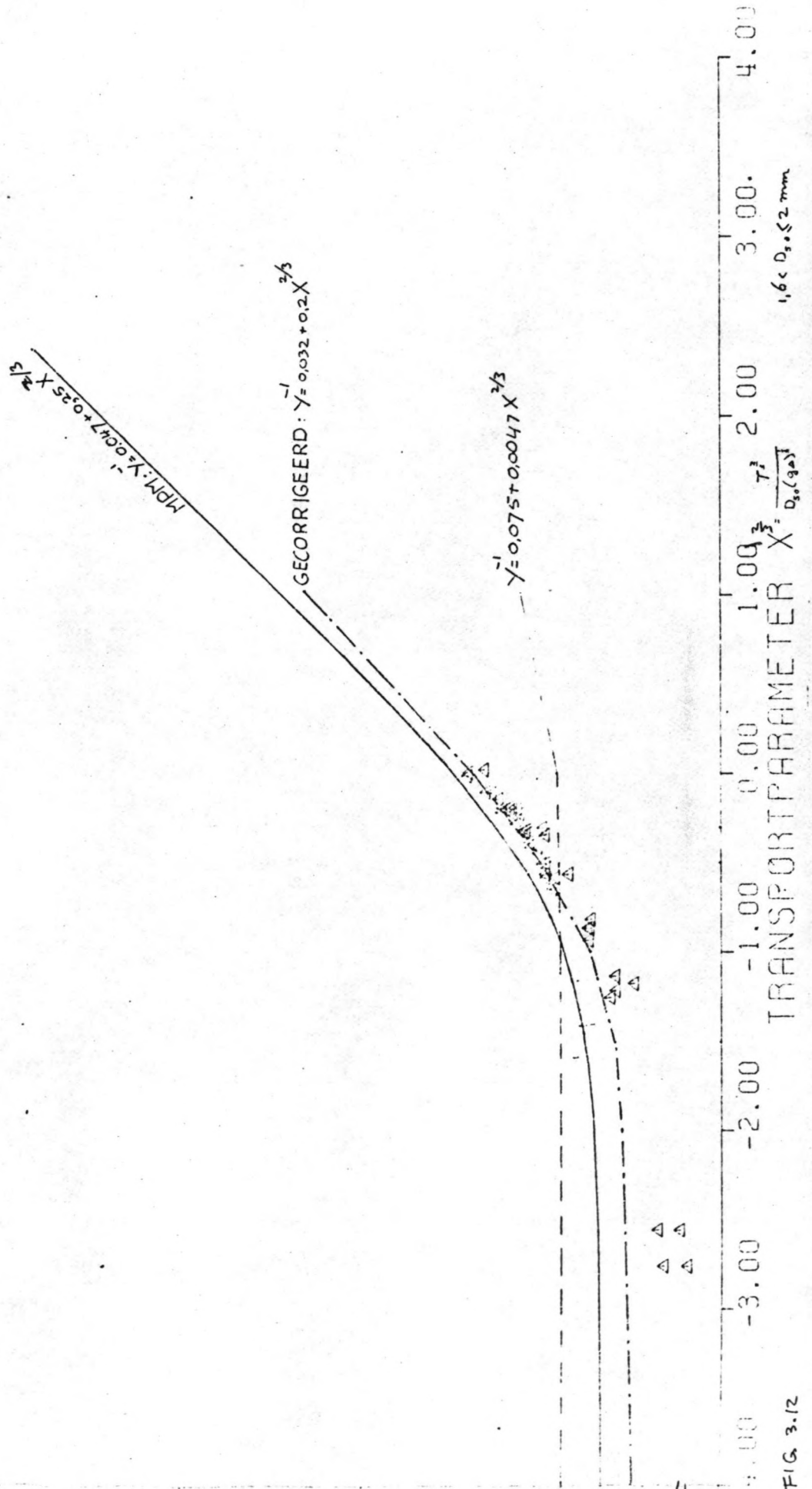


FIG. 3.12

INTERVAL NR 12: $2,0 < D_{50} \leq 2,6 \text{ mm}$

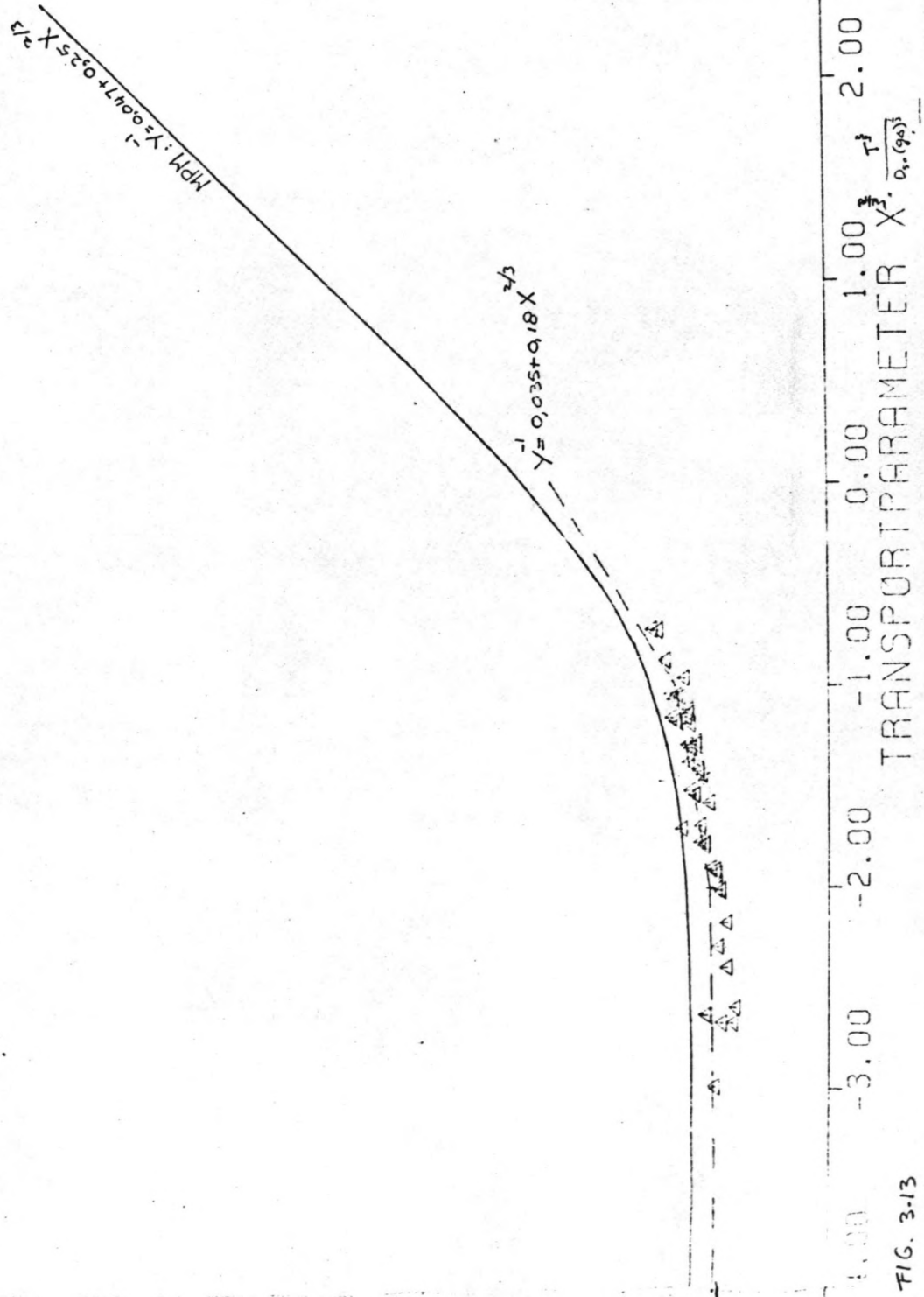


FIG. 3-13

41.3.91F

STROHPARAMETER $Y = \frac{u R D}{\Delta D_{50}}$

INTERVAL NR 13: $2,6 < D_{50} \leq 3,9 \text{ mm}$

MPM: $Y = 0,017 + 0,25 X^{2/3}$

$Y = 0,045 + 0,18 X^{2/3}$

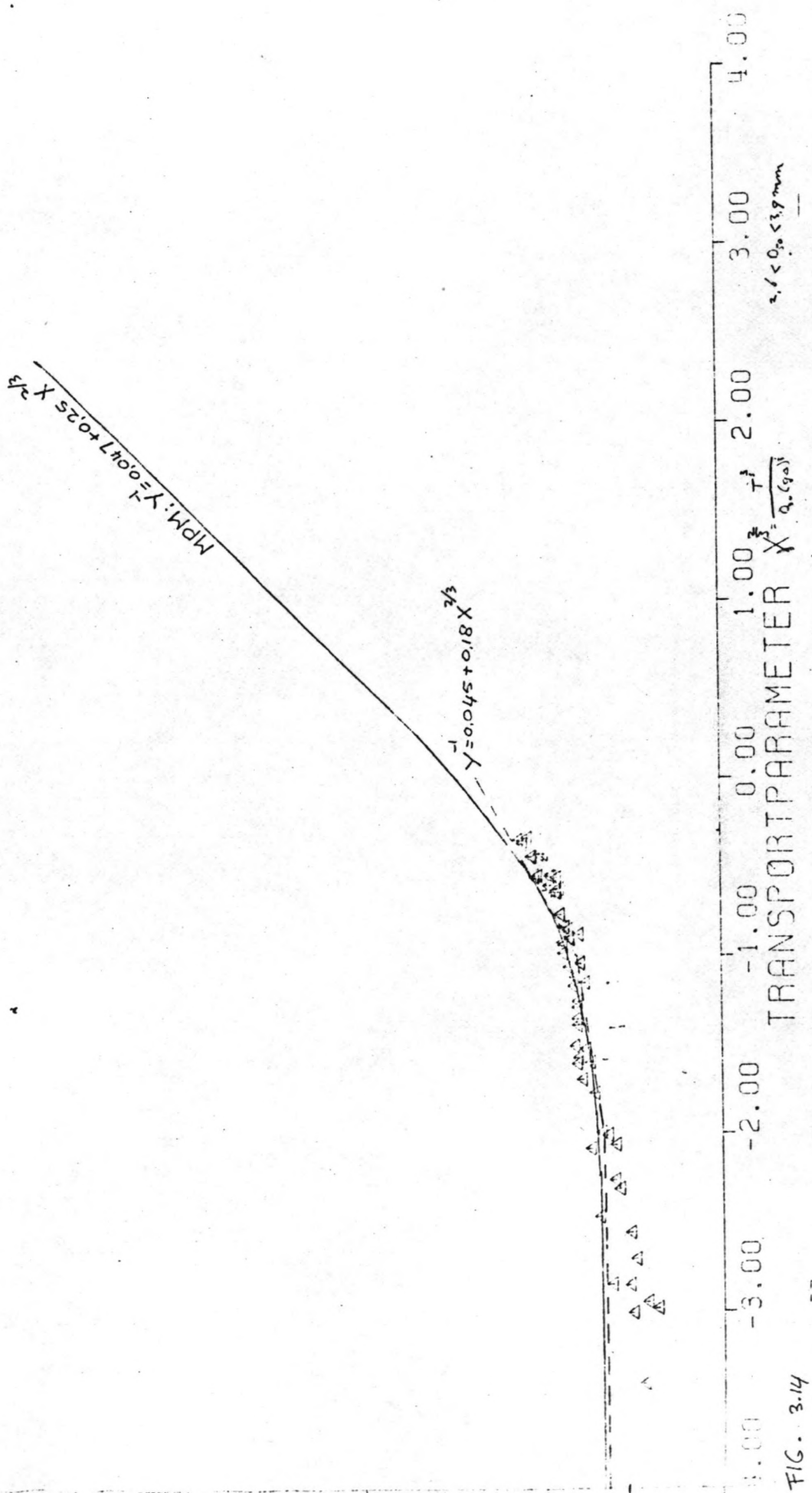


FIG. 3.14

513 91A

STROOMPARAMETER $Y = \frac{u R D}{\Delta D_{50}}$

INTERVAL NR 14: $3,9 < D_{50} \leq 5,5 \text{ mm}$

$MPM \cdot Y = 0,097 + 0,25 X^{2/3}$

$Y = 0,044 + 0,19 X^{2/3}$

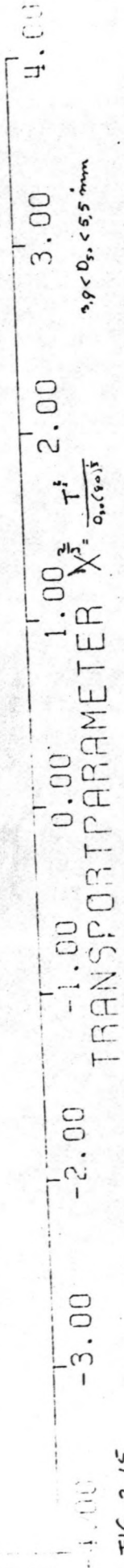


FIG. 3.15

91.3 91F

INTERVAL NR 15: $5,5 < D_{50} \leq 8,0 \text{ mm}$

STROOHPARAMETER $Y^{-1} = \frac{uR^2}{\omega D_{50}}$

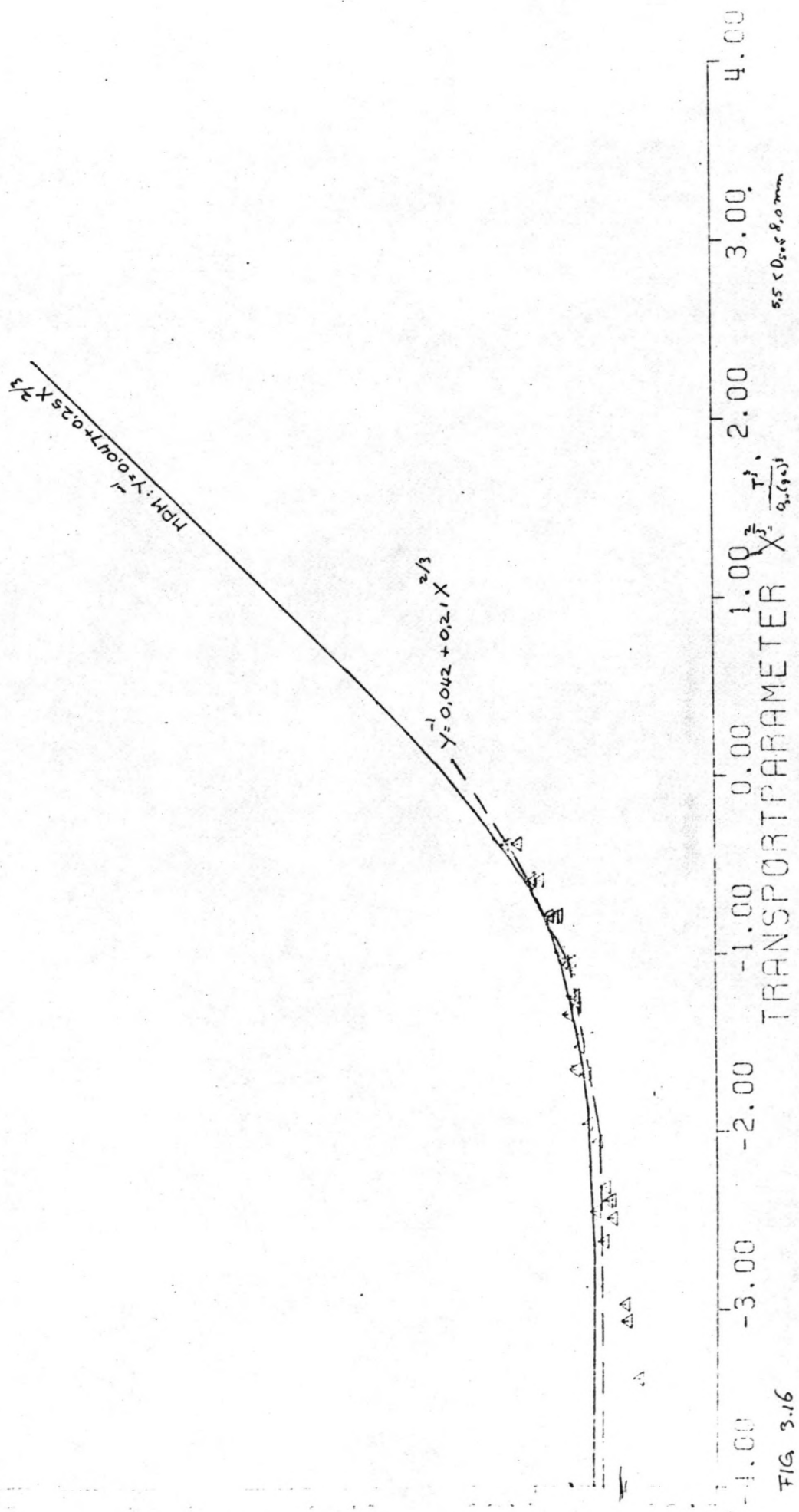


FIG 3.16

STROOMPARAMETER: $Y^1 = \frac{uR}{\Delta D_{50}}$

INTERVAL NR 16: $D_{50} > 8,0 \text{ mm}$

$MPM: Y^1 = 0,047 + 0,27 X^{2/3}$

$Y^1 = 0,047 + 0,27 X^{2/3}$

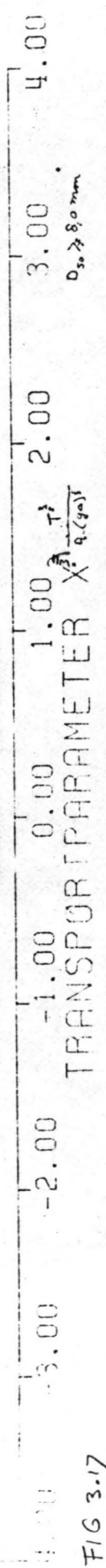


FIG 3.17

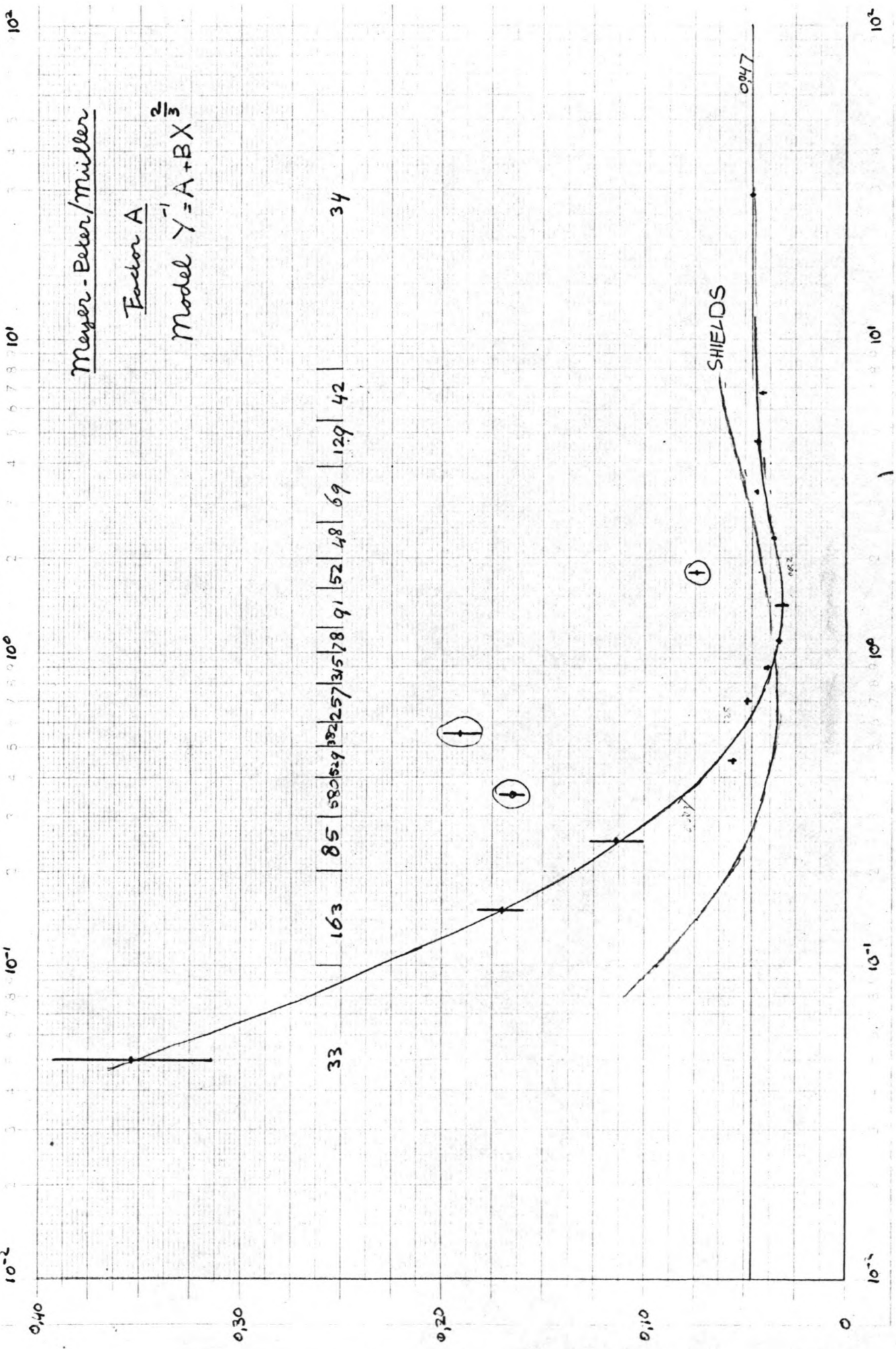
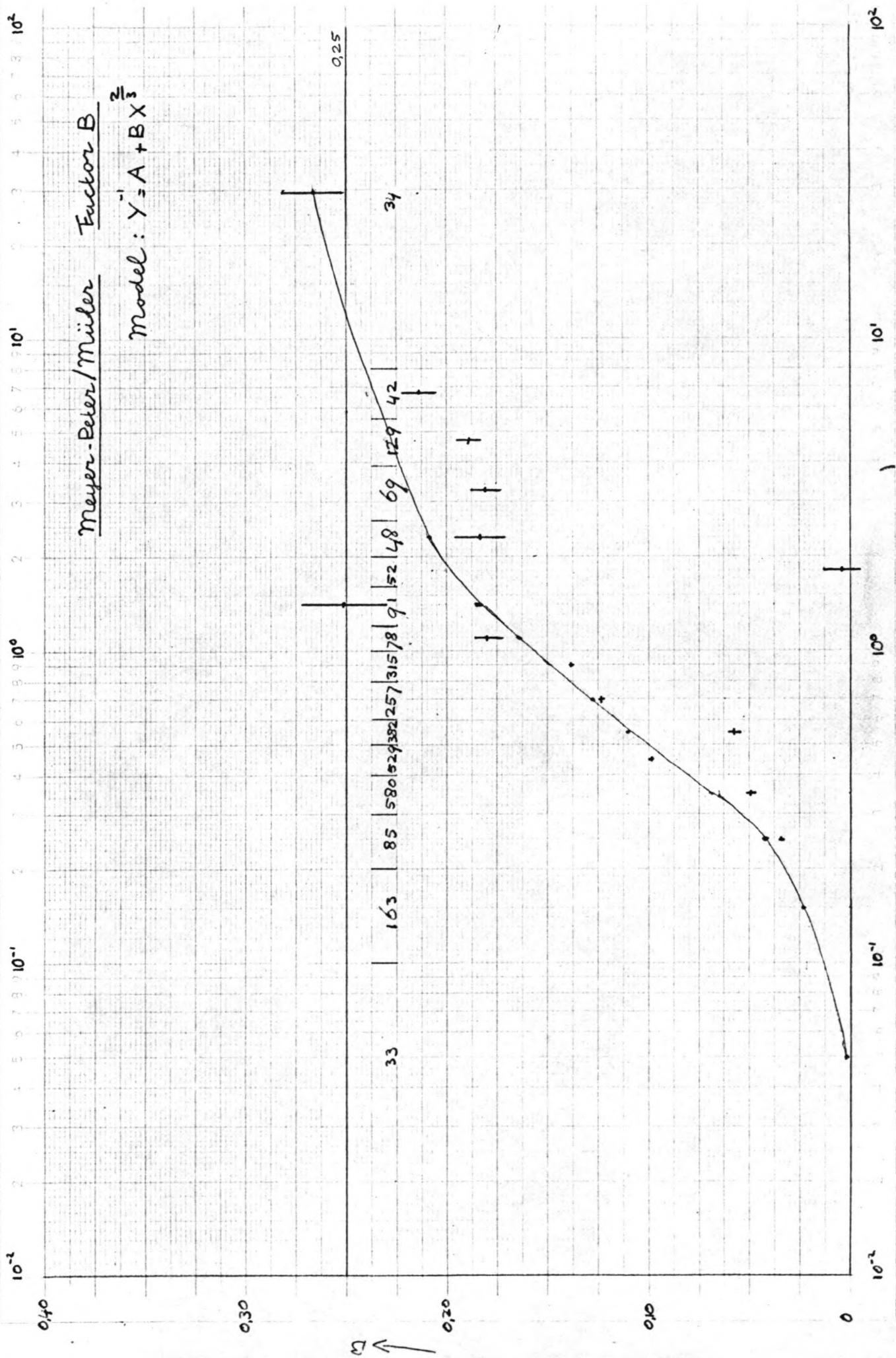


FIG. 3.18

→ D₅₀ in mm

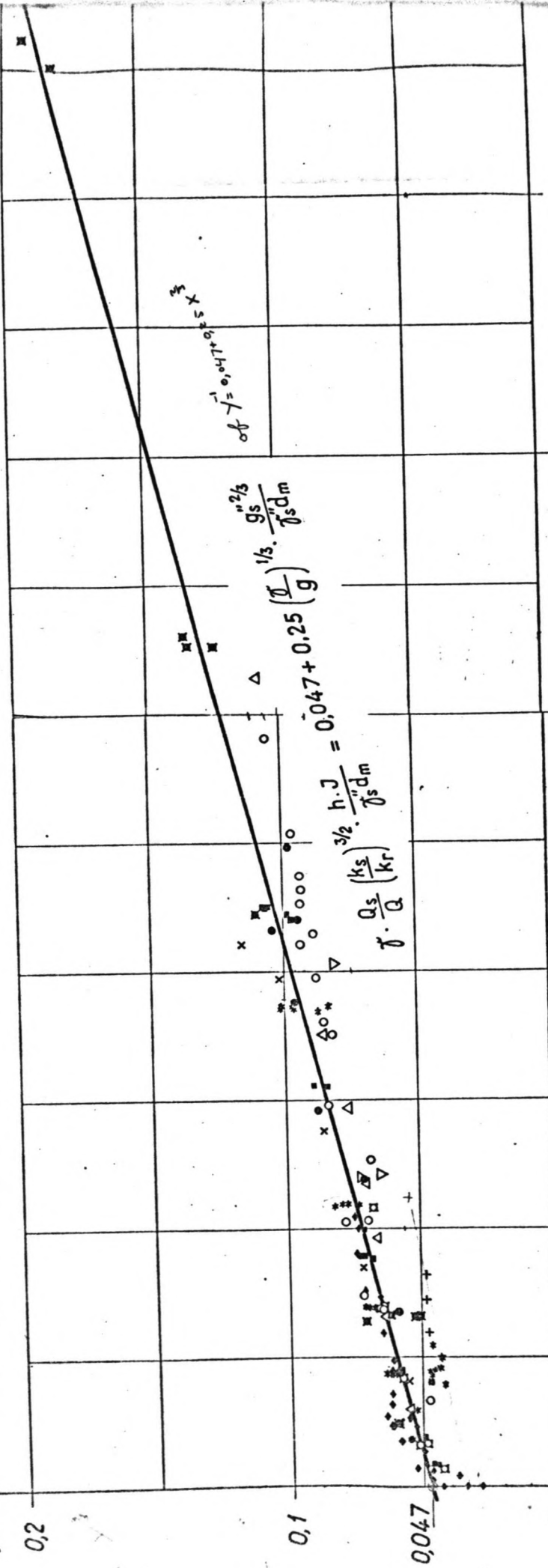


No. 124 $\rightarrow D_{50}$ in mm.

Kaslova, unpubl. 1967, p. 10, fig. 10

FIG. 3-19.

$$\sigma \cdot \frac{R_s \cdot J_r}{J_s \cdot d_m} = \sigma \cdot \frac{U_s}{Q} \left(\frac{k_s}{k_r} \right)^{1/2} \cdot \frac{n \cdot J}{J_s \cdot d_m} = \gamma$$



$$\gamma = \left(\frac{d}{g} \right)^{1/5} \cdot \frac{g_s^{2/5}}{J_s \cdot d_m}$$

Abb. 5

1954
1/5
1954

TIG. 3.20

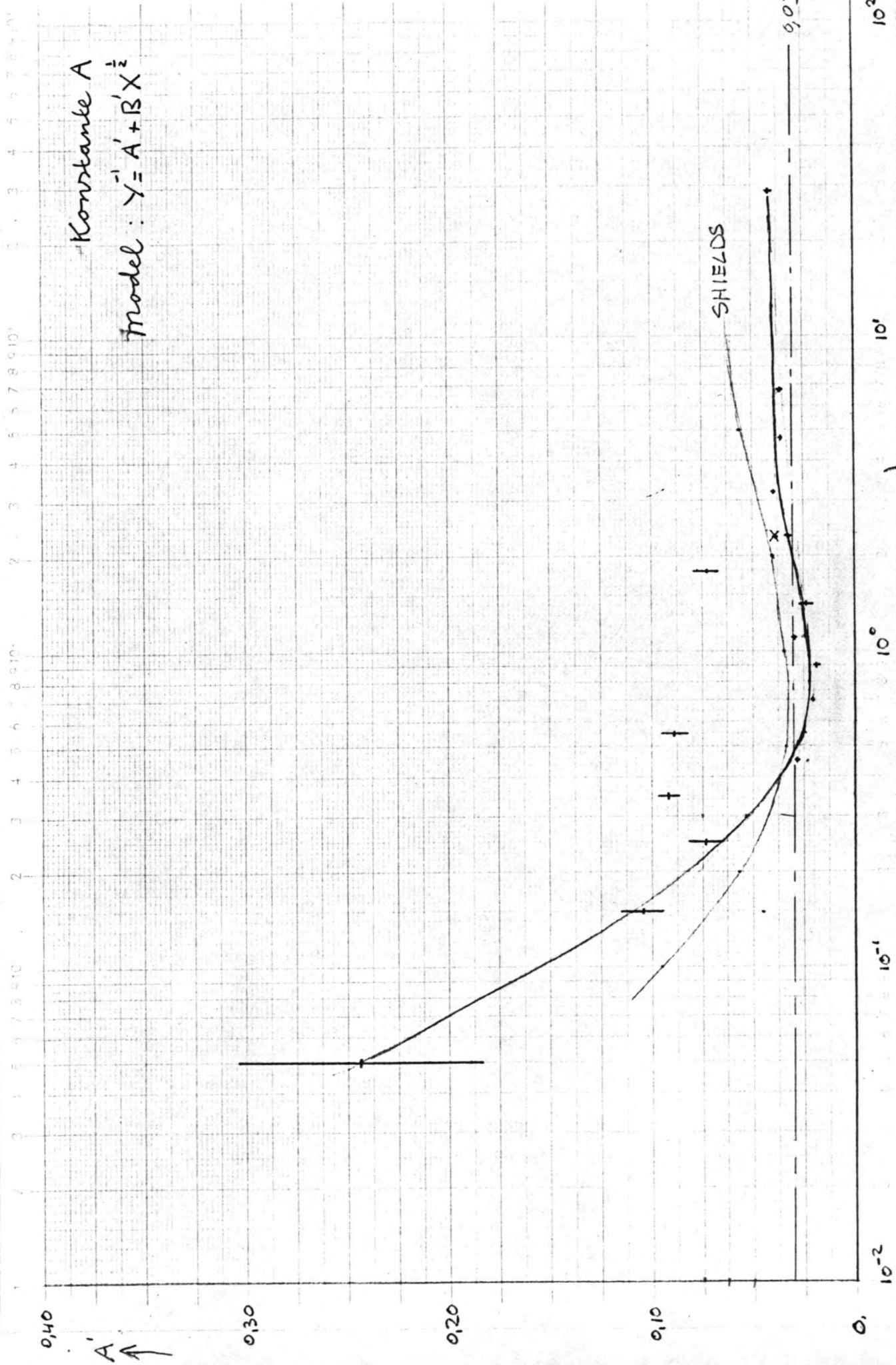


FIG. 3.21

metabolic water ...

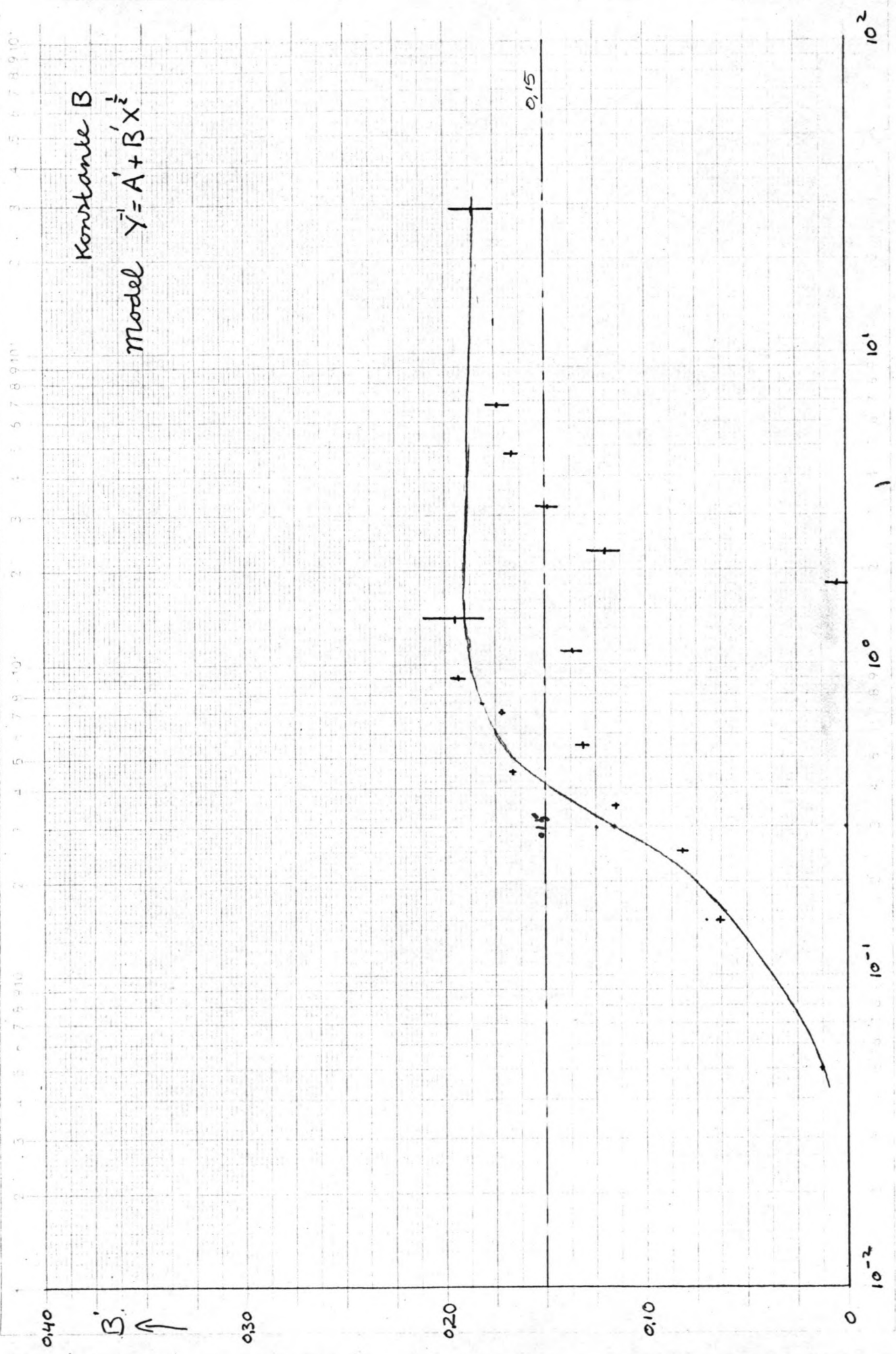


FIG. 3.22

Fig. 3.23 t/m 3.38 : Relatie tussen $x^{2/3}$ en Y^{-1}

volgens : - Meyer Peter Müller

- 1^{ste} modificatie van M.P.M.
- 2^e modificatie van M.P.M.
- 3^e modificatie van M.P.M.

INTERVAL NR 1: $D_{50} \leq 0,1 \text{ mm}$

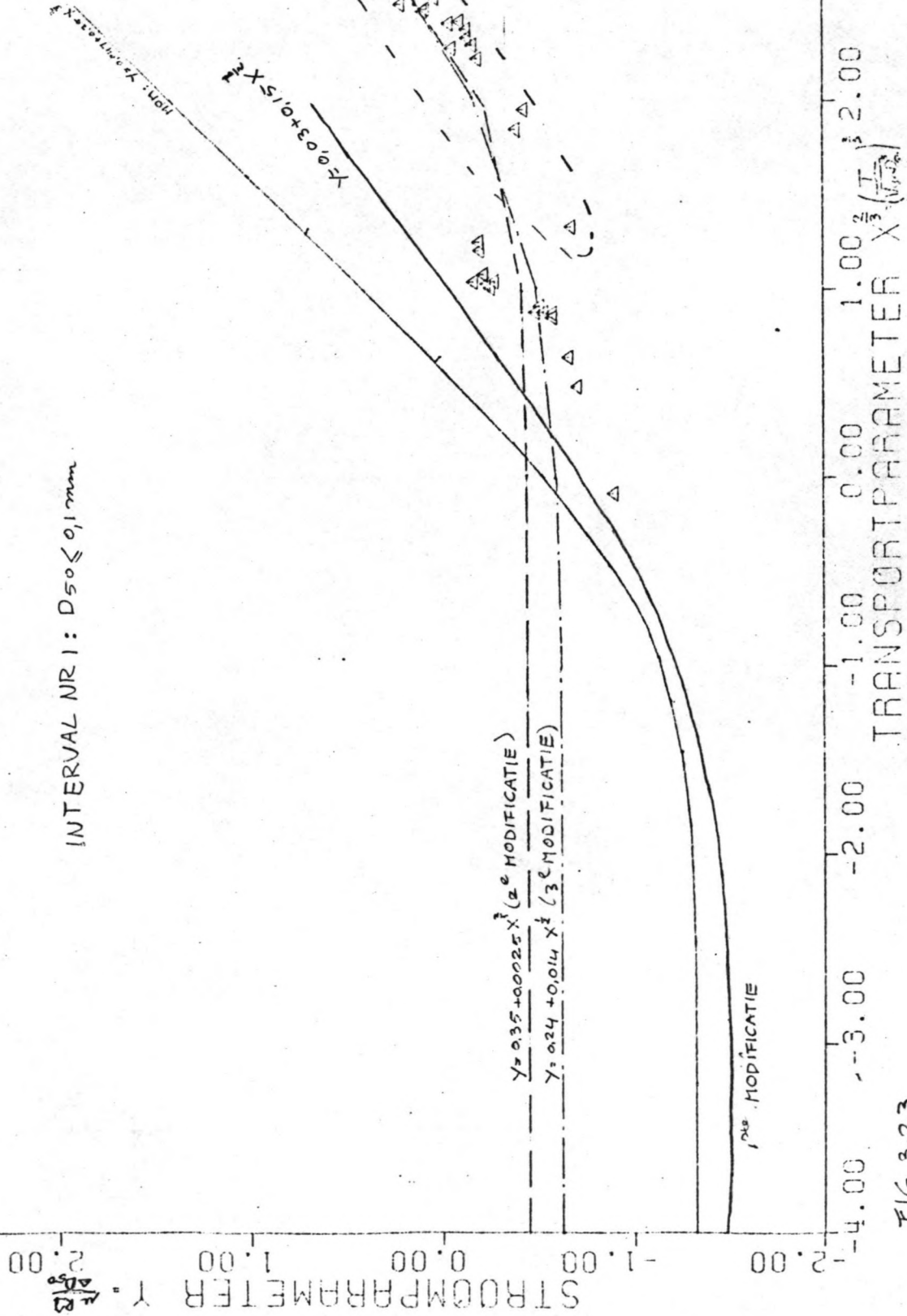


FIG 3.23

STROOMPARAMETER $T = \frac{R D_{50}}{4 R D}$

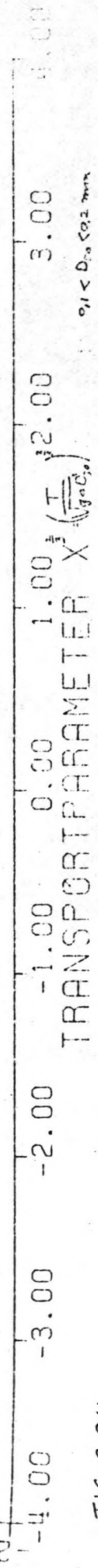
MPM: $Y = 0.017 + 0.23 X^{\frac{1}{2}}$

INTERVAL NR 2: $0.1 < D_{50} \leq 0.2 \text{ mm}$

$Y = 0.17 + 0.23 X^{\frac{1}{2}}$
 $Y = 0.11 + 0.055 X^{\frac{1}{2}}$

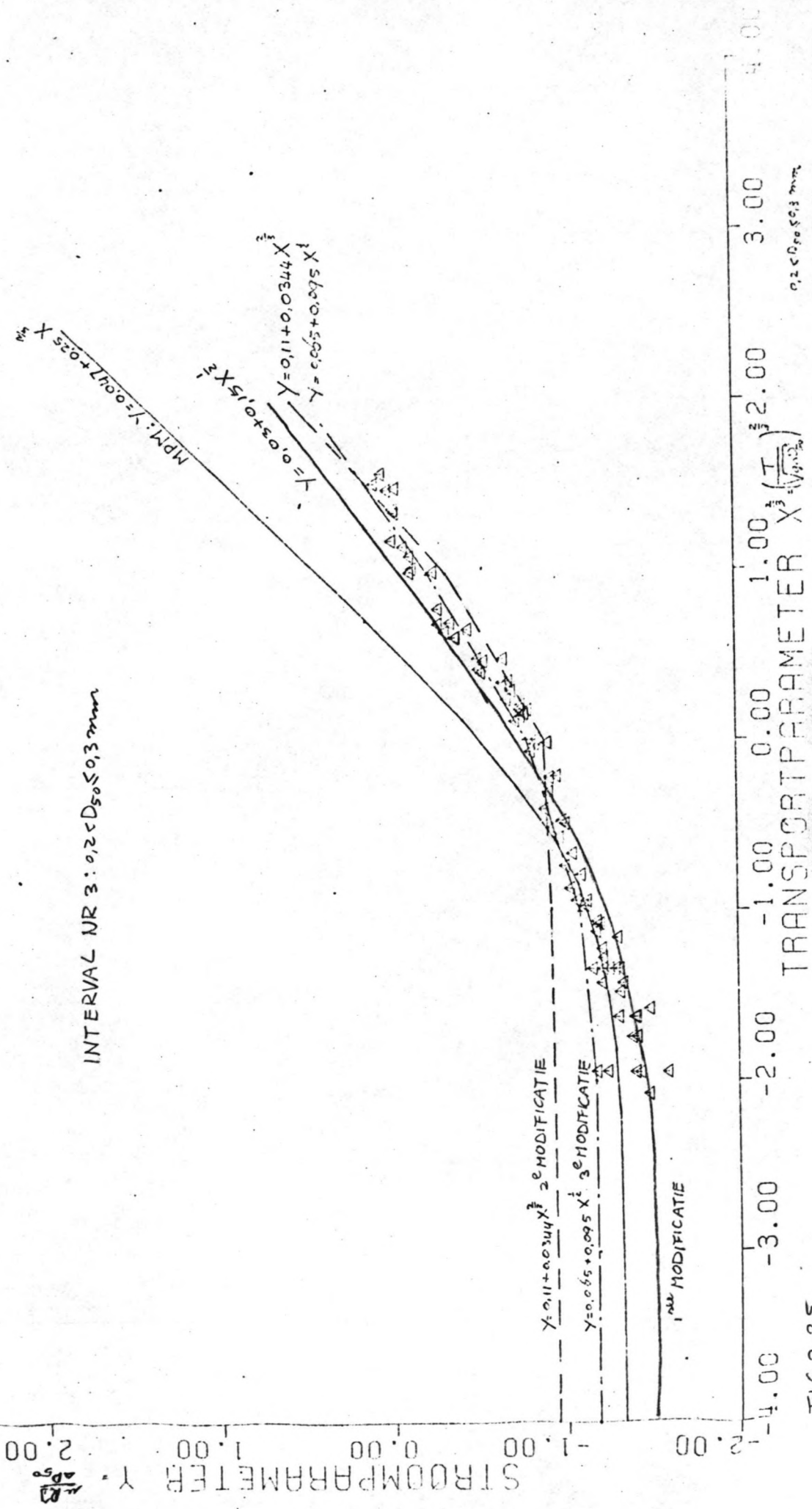
$Y = 0.17 + 0.23 X^{\frac{1}{2}}$ 2e MODIFICATIE
 $Y = 0.11 + 0.055 X^{\frac{1}{2}}$ 3e MODIFICATIE

1ste MODIFICATIE



$0.1 < D_{50} \leq 0.2 \text{ mm}$

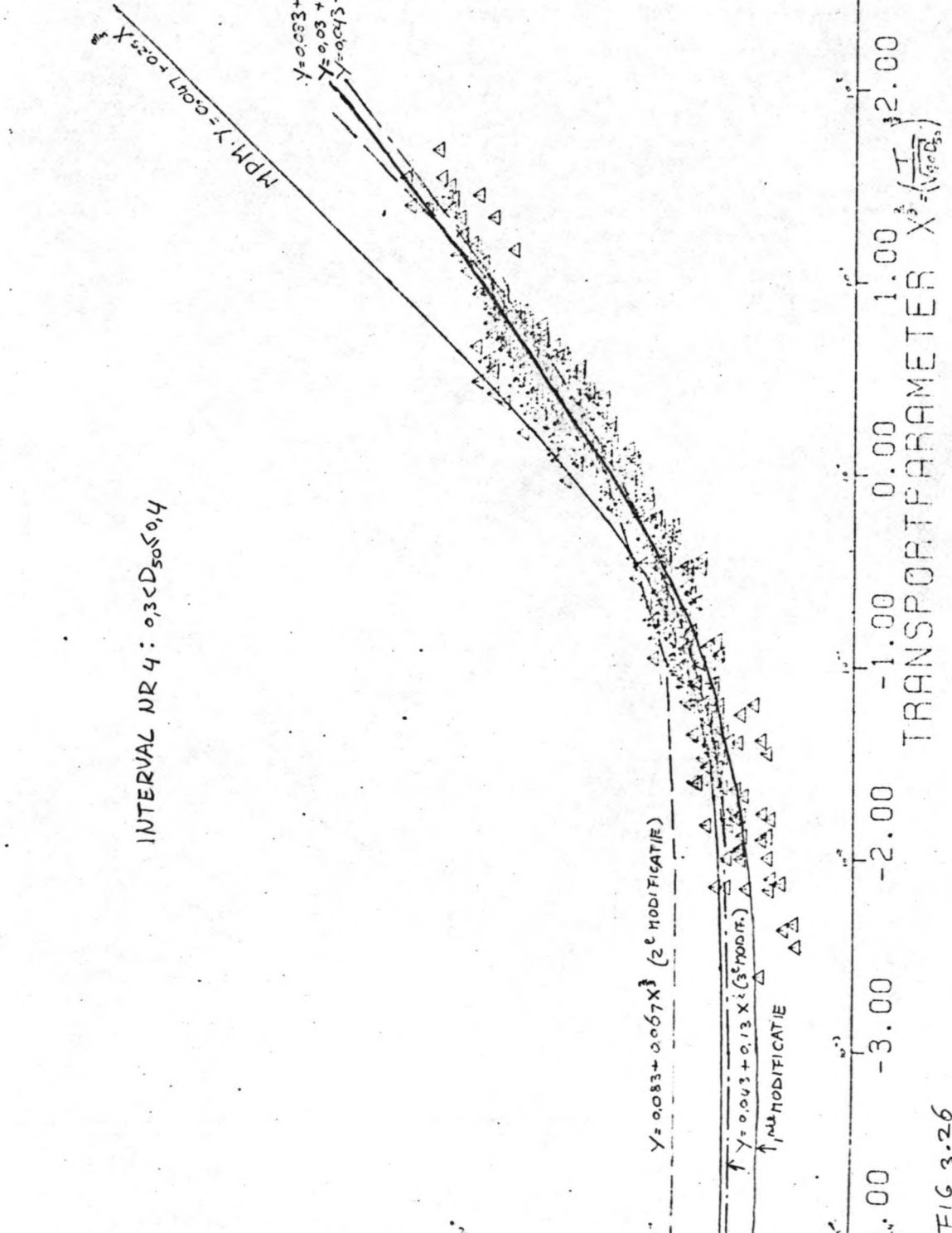
FIG 3.24



INTERVAL NR 3: 0.2 < D_{50} < 0.3 mm

FIG 3.25

STROOMPARAMETER $Y = \frac{d}{D_{50}} \left(\frac{V}{V_{*c}} \right)^2$



INTERVAL NR 4: $0.3 < D_{50} < 0.4$

FIG 3.26

STROMPARAMETER $\gamma = \frac{D_{50}}{D_{95}}$

INTERVAL NR 5: $0.4 < D_{50} \leq 0.5 \text{ mm}$

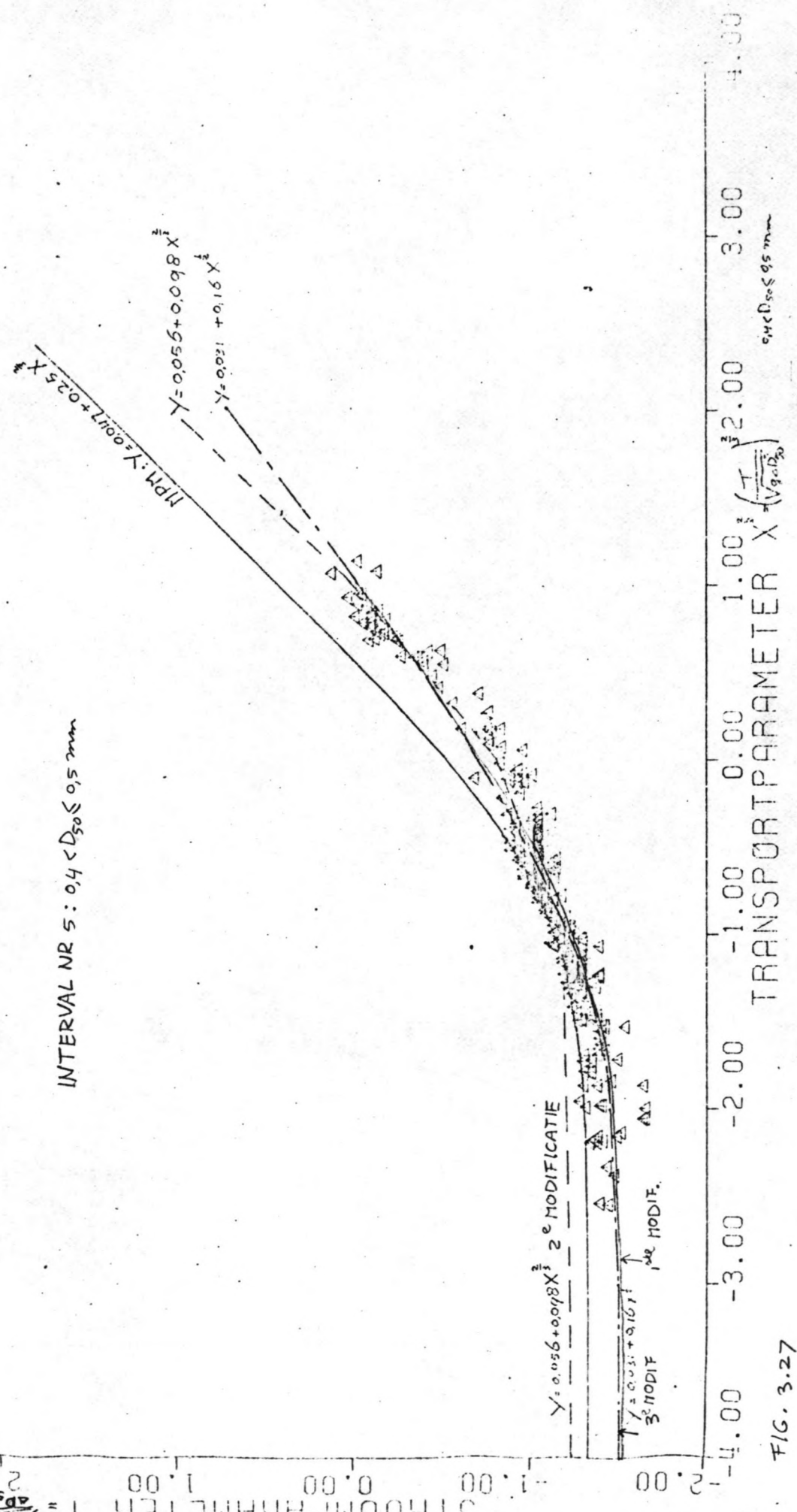


FIG. 3.27

STROOMPARAMETER $1 = \frac{4D_{50}}{R^2} \approx 2.00$

INTERVAL NR 6: $0.5 < D_{50} \leq 0.6 \text{ mm}$

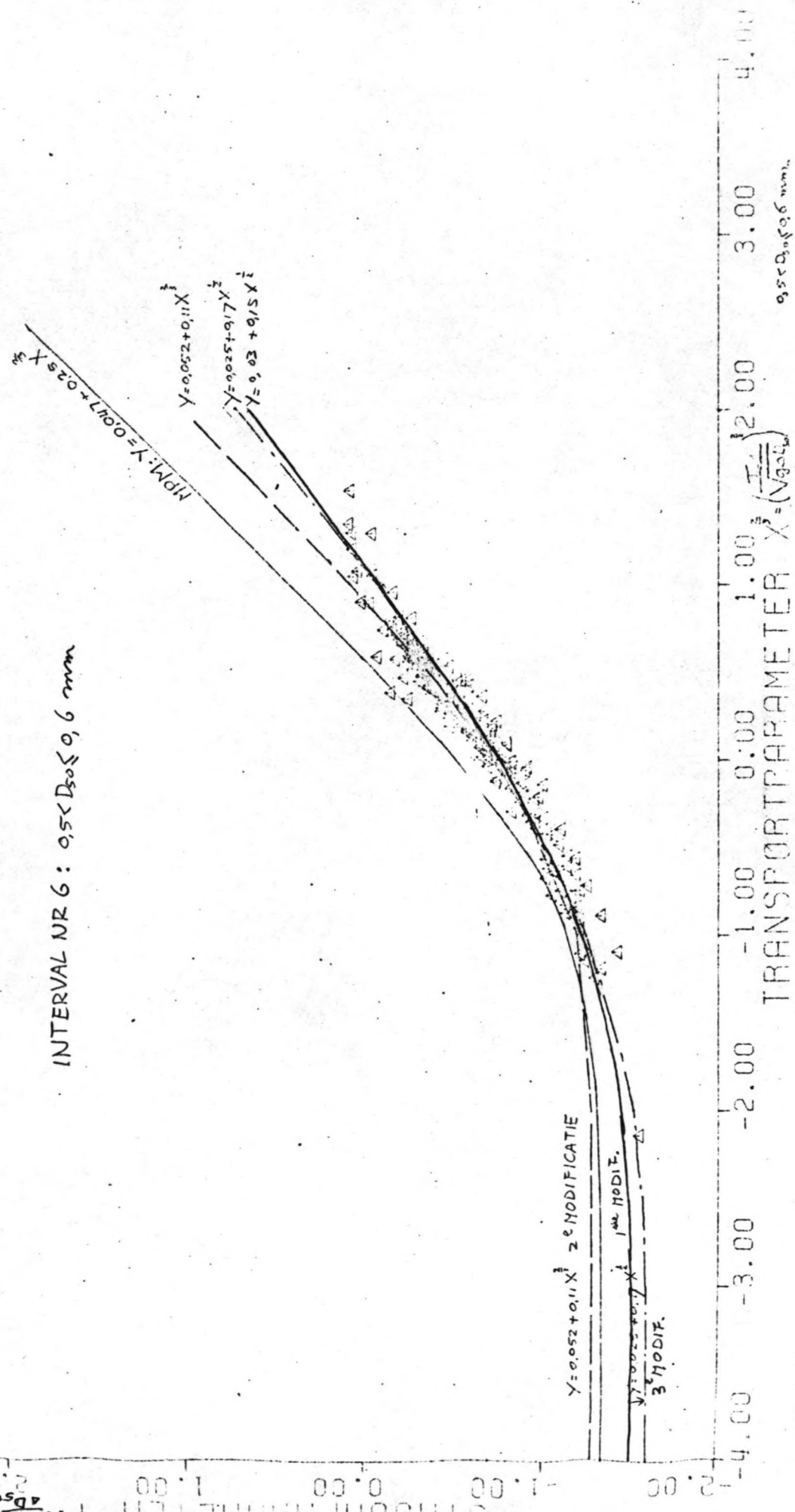


FIG. 3.28

STROOMPARAMETER $Y = \frac{K R^3}{\Delta D_{50}^3}$

2.00
1.00
0.00
-1.00
-2.00

INTERVAL NR 7: $0,6 < D_{50} \leq 0,8$ mm

MPM $Y = 0,017 + 0,25 X$

$Y = 0,049 + 0,12 X^{\frac{2}{3}}$
 $Y = 0,020 + 0,18 X^{\frac{2}{3}}$
 $Y = 0,03 + 0,15 X^{\frac{2}{3}}$ (1e MODIFICATIE)

$Y = 0,029 + 0,12 X^{\frac{2}{3}}$ 2e MODIFICATIE

$Y = 0,020 + 0,18 X^{\frac{2}{3}}$ 3e MODIFICATIE

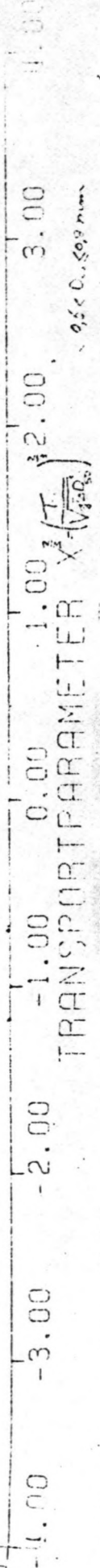


FIG. 3.29

STROOMPARAMETER $Y = \frac{u}{u_{*0}}$

INTERVAL NR 8: $0.8 < D_{50} \leq 1.0 \text{ mm}$

$MPM: Y = 0.004 + 0.25 X_i$

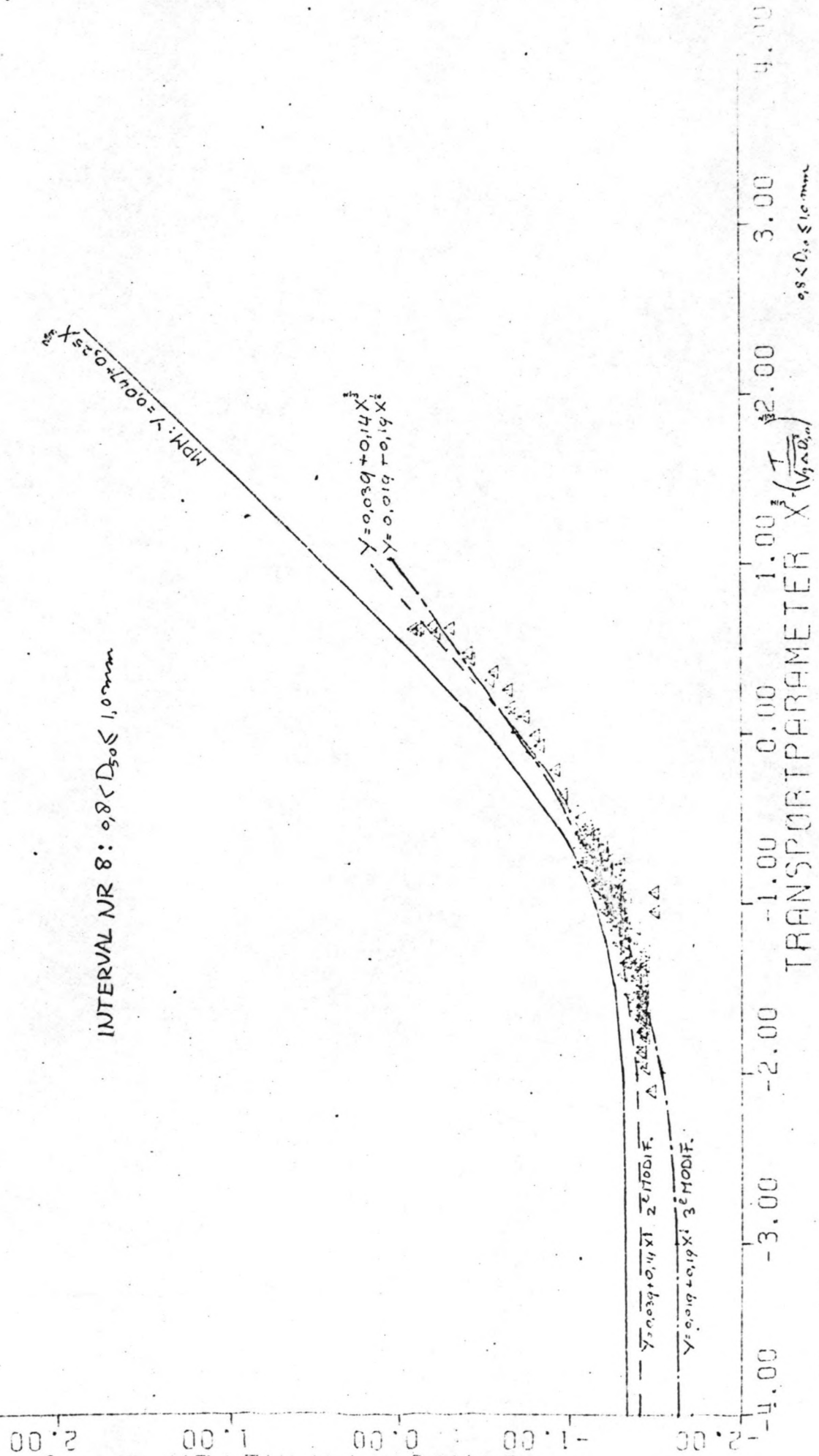
$Y = 0.039 + 0.14 X_i$
 $Y = 0.019 + 0.19 X_i$

$Y = 0.039 + 0.14 X_i$ 2 MODIF.
 $Y = 0.019 + 0.19 X_i$ 3 MODIF.

TRANSPORTPARAMETER $X_i \left(\frac{T}{\rho g D_{50}^3} \right)$

$0.8 < D_{50} \leq 1.0 \text{ mm}$

FIG 3.30



STROOMPARAMETER $Y = \frac{R3}{d_{50}^2}$

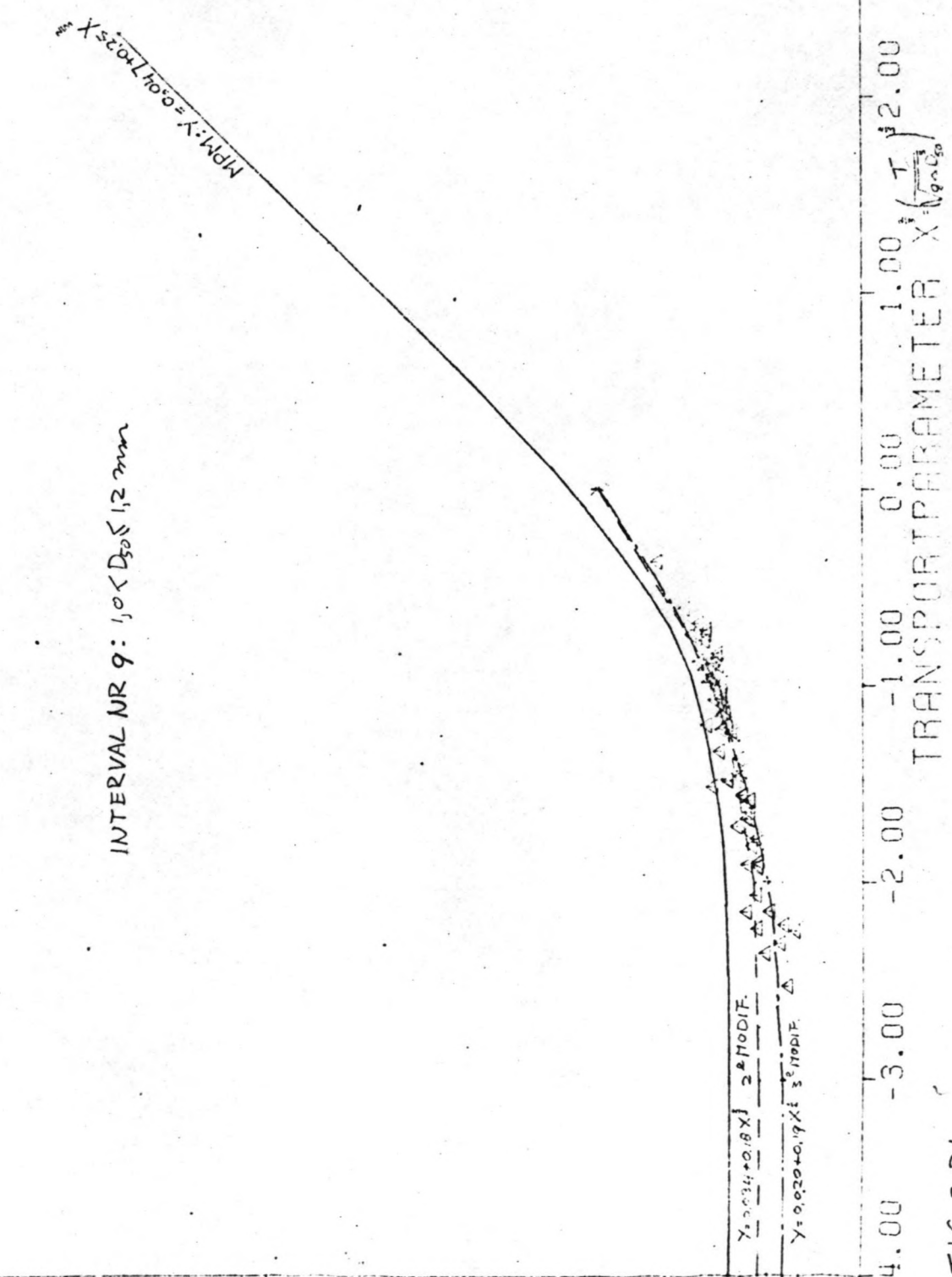


FIG 3.31

STROOPPARAMETER $\gamma = \frac{K R^2}{\Delta D_{50}}$

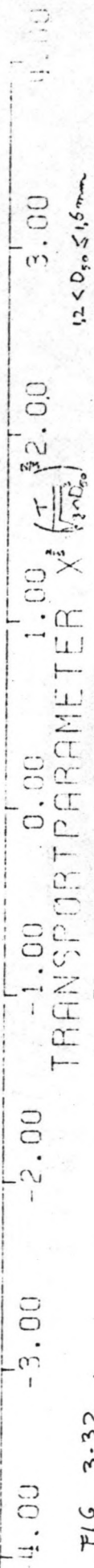
INTERVAL NR 10: $1,2 < D_{50} \leq 1,6 \text{ mm}$

$KPM: Y = 0,007 + 0,25 X^2$

$Y = 0,031 + 0,25 X^2$
 $Y = 0,025 + 0,19 X^2$

$Y = 0,031 + 0,25 X^2$ 2 MODIF

$Y = 0,025 + 0,19 X^2$ 3 MODIF



$1,2 < D_{50} \leq 1,6 \text{ mm}$

FIG 3-32

STROOMPARAMETER $Y = \frac{D_0}{D_{50}}$

2.00
1.00
0.00
-1.00
-2.00

INTERVAL NR 11: $1,6 < D_{50} \leq 2 \text{ mm}$

$MPM: Y = 0,017 + 0,25 X^3$

2^e MODIFICATIE

$Y = 0,032 + 0,20 X^3$

3^e MODIFICATIE

$Y = 0,030 + 0,19 X^3$

4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
-4.00

$1,6 < D_0 \leq 2 \text{ mm}$

TRANSPORTPARAMETER $X = \left(\frac{T}{g \cdot D_{50}} \right)^{0,5}$

△ △ △

△ △

FIG 3.33

STROMPARAMETER $Y = \frac{D_{50}}{D_p}$

INTERVAL NR 12 : $2,0 < D_{50} \leq 2,6 \text{ mm}$

$$KPM: Y = 0,017 + 0,5 X^2$$

1. MODIFICATIE
 $Y = 0,035 + 0,19 X^2$
 $Y = 0,13 + 0,15 X^2$
 2. MODIFICATIE

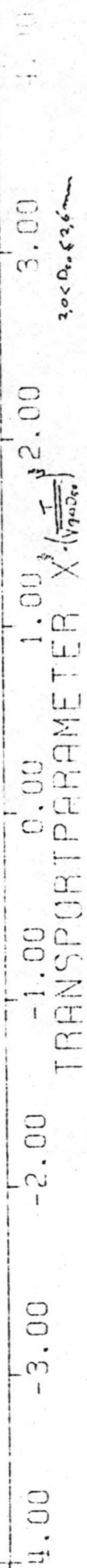


FIG 3.34

$3,0 < D_p \leq 3,6 \text{ mm}$

STROOMPARAMETER $Y = \sqrt{\frac{R_0}{D_0}}$

INTERVAL NR 13 : $2,6 < D_{90} \leq 3,9 \text{ mm}$

MPM: $Y = 0,017 + 0,25 X^3$

$Y = 0,045 + 0,18 X^3$ 2^e MODIFICATIE

$Y = 0,039 + 0,19 X^3$ 3^e MODIFICATIE

TRANSPORTPARAMETER $X = \left(\frac{T}{\sqrt{g_0 D_{90}}} \right)$

$2,6 < D_{90} \leq 3,9 \text{ mm}$

FIG 3.35

STANDARD DEVIATION $\sigma = \frac{R}{D_{50}}$

INTERVAL NR 14: $3.9 < D_{50} \leq 5.5$

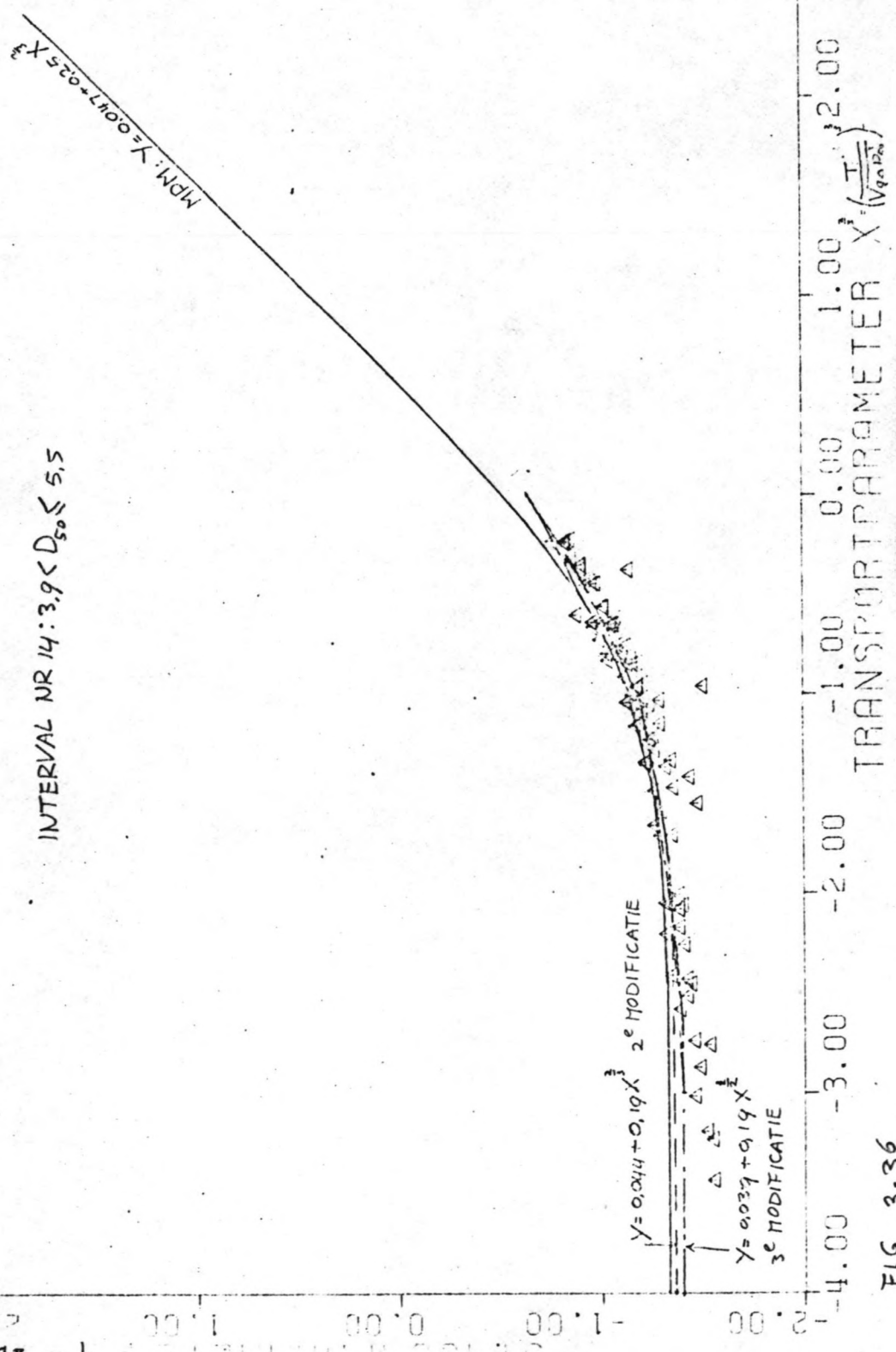


FIG 3-36

STROOMPARAMETER $\gamma = \frac{D}{D_0}$

-2.00 -1.00 0.00 1.00 2.00

INTERVAL NR 15: $5.5 < D_{50} \leq 8.0 \text{ mm}$

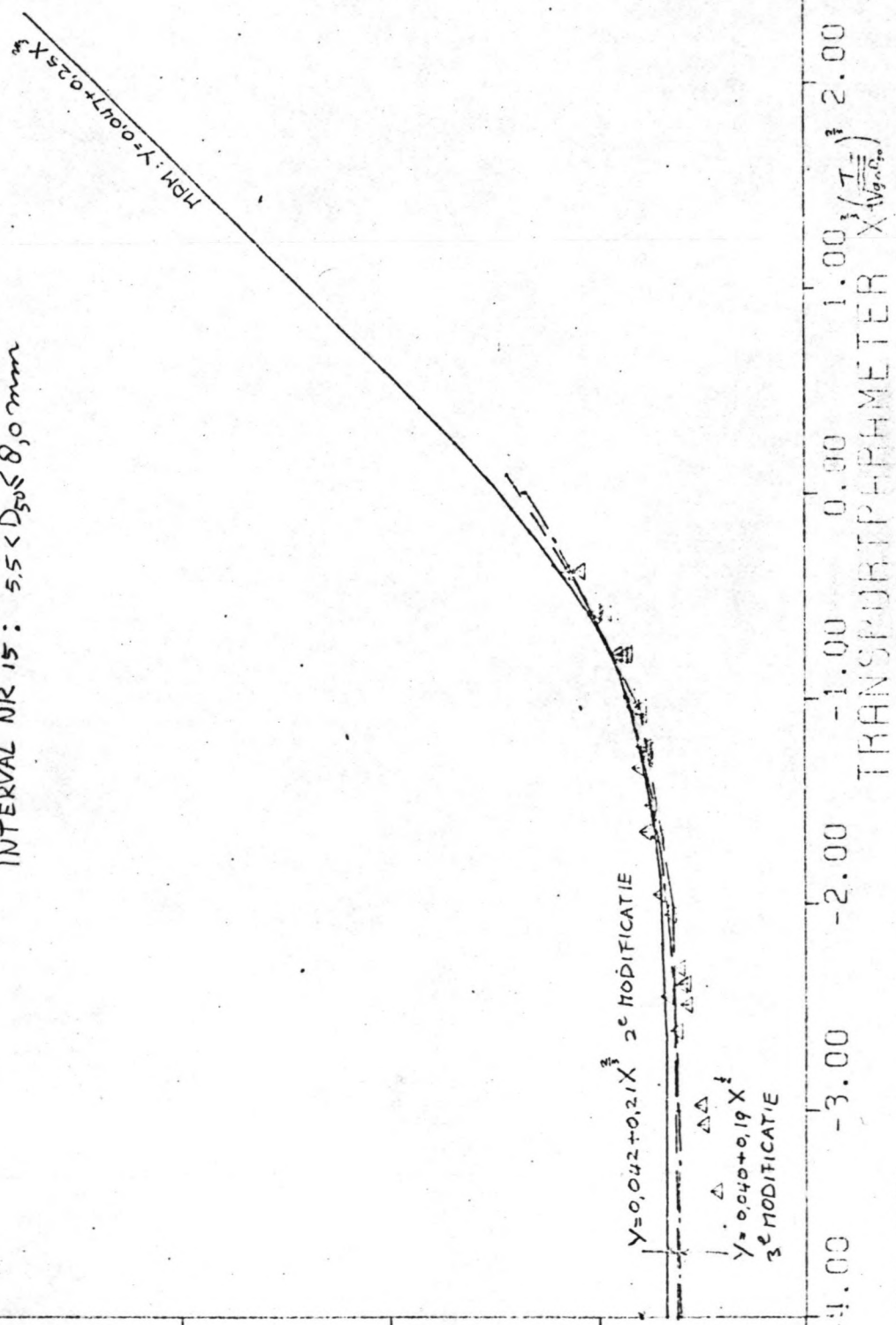


FIG 3.37

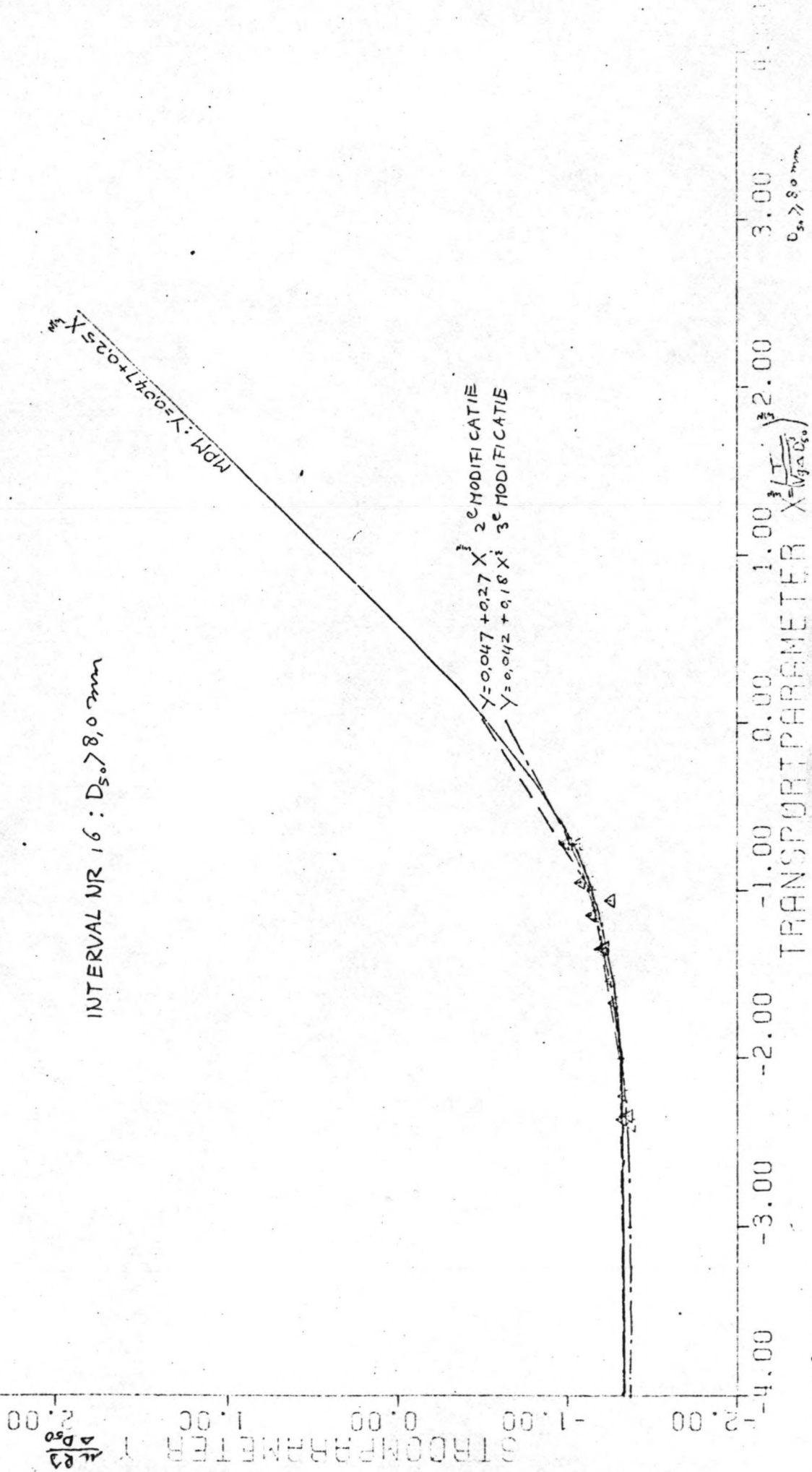


FIG 3-38

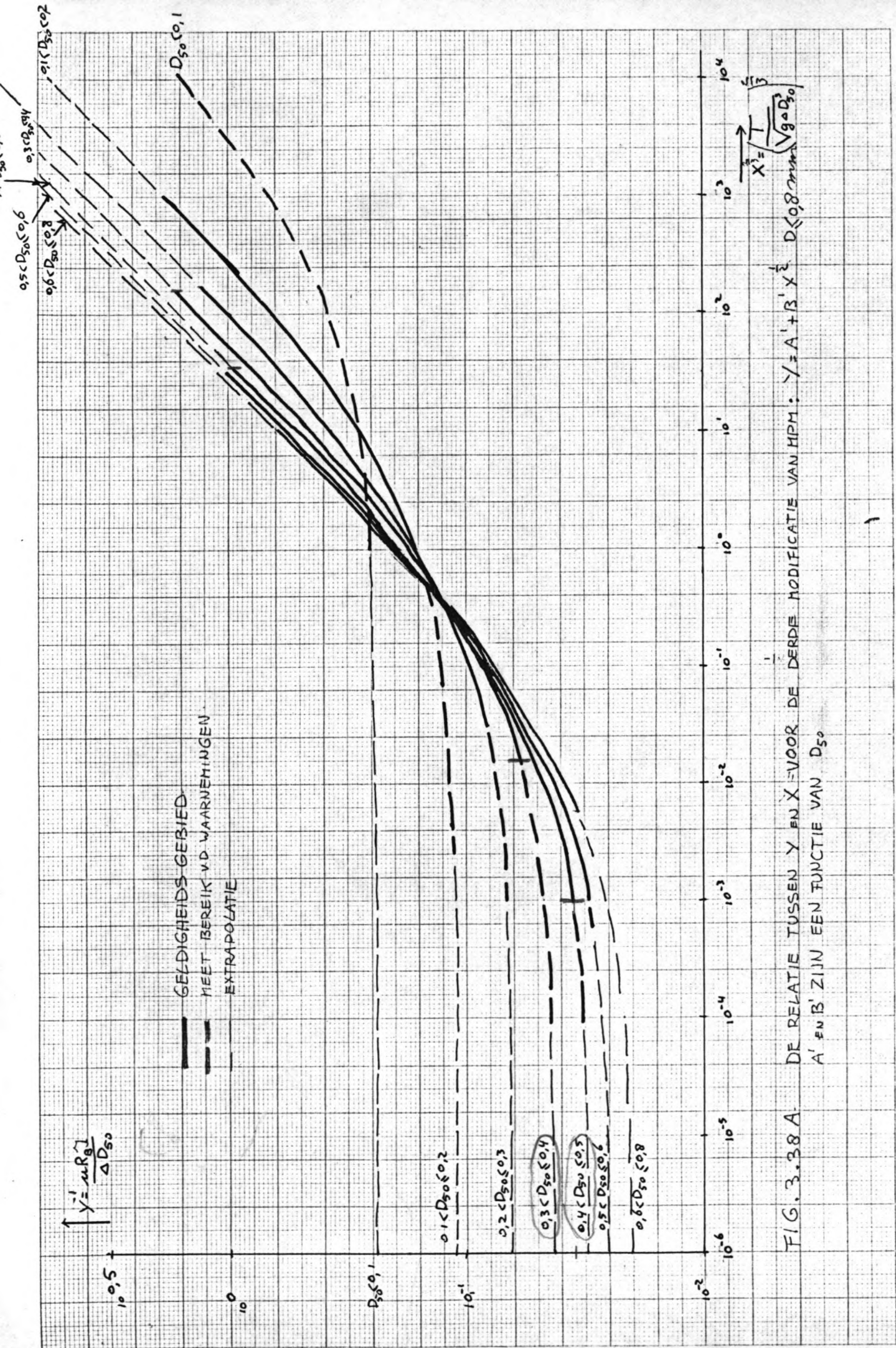
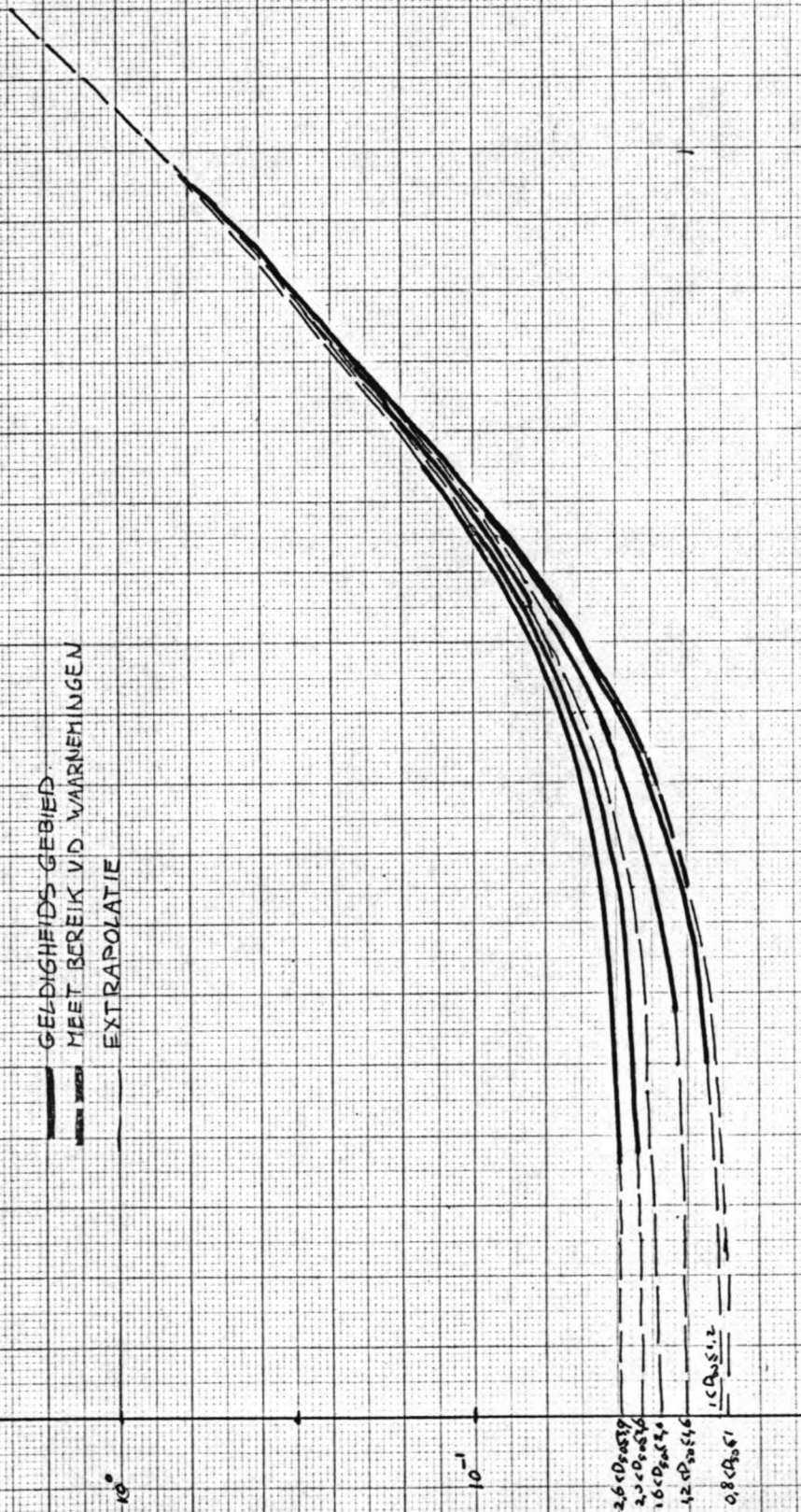


FIG. 3.38 A. DE RELATIE TUSSEN Y EN X = VOOR DE DERDE MODIFICATIE VAN HPM: Y = A' + B' X² D < 0.8 mm (Vg D₅₀)^{1/3} A' EN B' ZIJN EEN FUNCTIE VAN D₅₀

$$Y^{-1} = \frac{\mu R_0^2}{\Delta D_{50}}$$

———— GELDIGHEIDS GEBIED
 ———— MEET BEREIK V.D. WAARNEMINGEN
 - - - - - EXTRAPOLATIE



2.6 cm
 2.0 cm
 1.6 cm
 1.2 cm
 0.8 cm

10^{-2} 10^{-6} 10^{-5} 10^{-4} 10^{-3} 10^{-2} 10^{-1} 10^0 10^1 10^2 10^3 10^4

$X = \left(\frac{T}{Vg \Delta D_{50}^3} \right)^{2/3}$

FIG 3.38 B DE RELATIE TUSSEN Y EN X VOOR DE DERDE MODIFICATIE VAN MPIT: $Y = A' + B' X^2$ ($D_{50} > 0.8 \text{ mm}$)
 A' EN B' ZIJN IEEU FUNCTIE VAN D_{50}

HOOFDSTUK 4



-7P,8

Fig. 4.1 Relatie tussen de exponenten van de machtsformule ($X = aY^p V^q$) en Y, volgens Engelund Hansen.

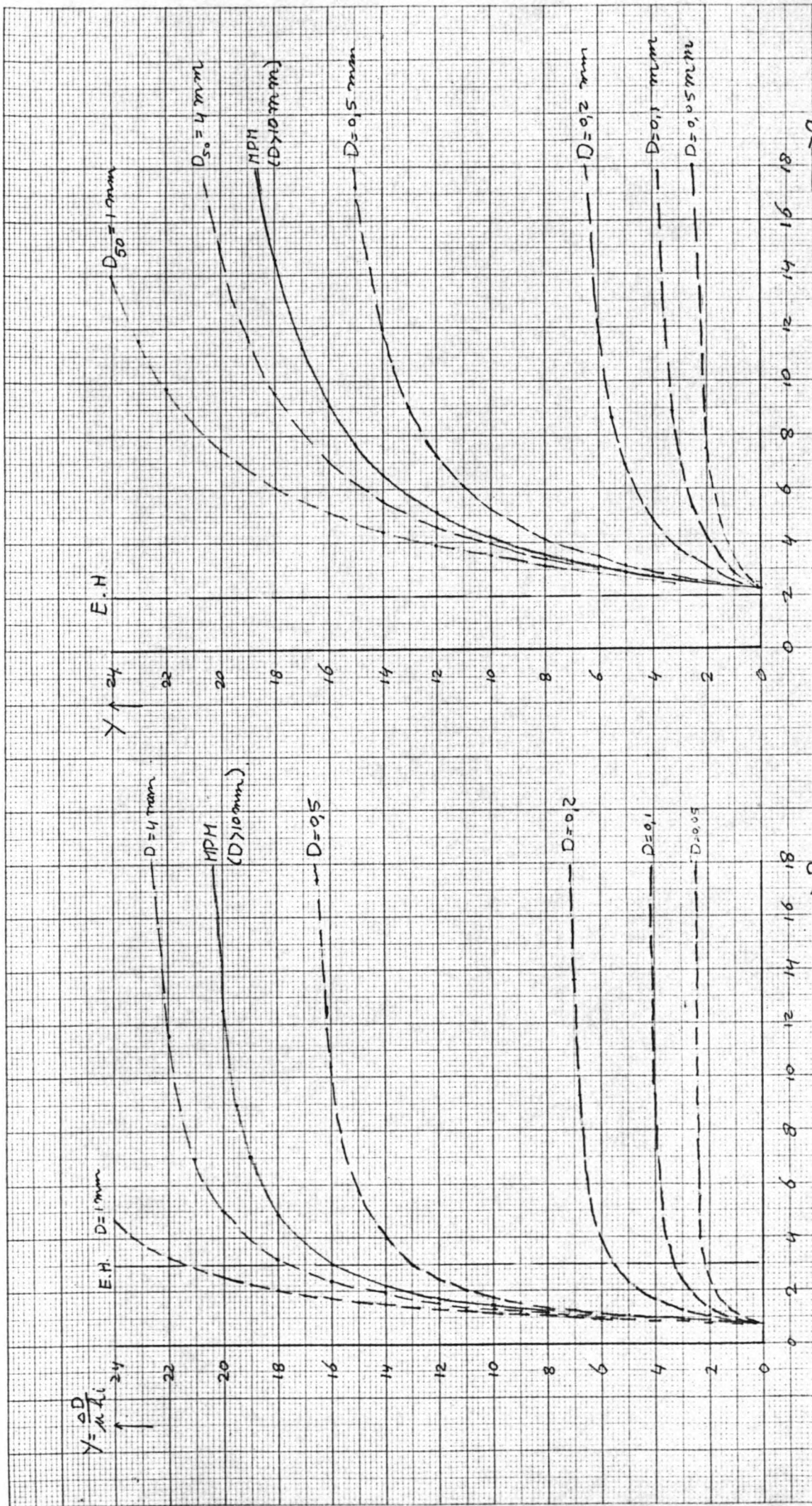


Fig. 4.2 Relatie tussen de exponenten van de machtsformule ($X = a \frac{Y^p}{V^q}$) en Y volgens M.P.M. en de 2^e modificatie van M.P.M.

— MPH
 --- 2^e MODIFICATIE

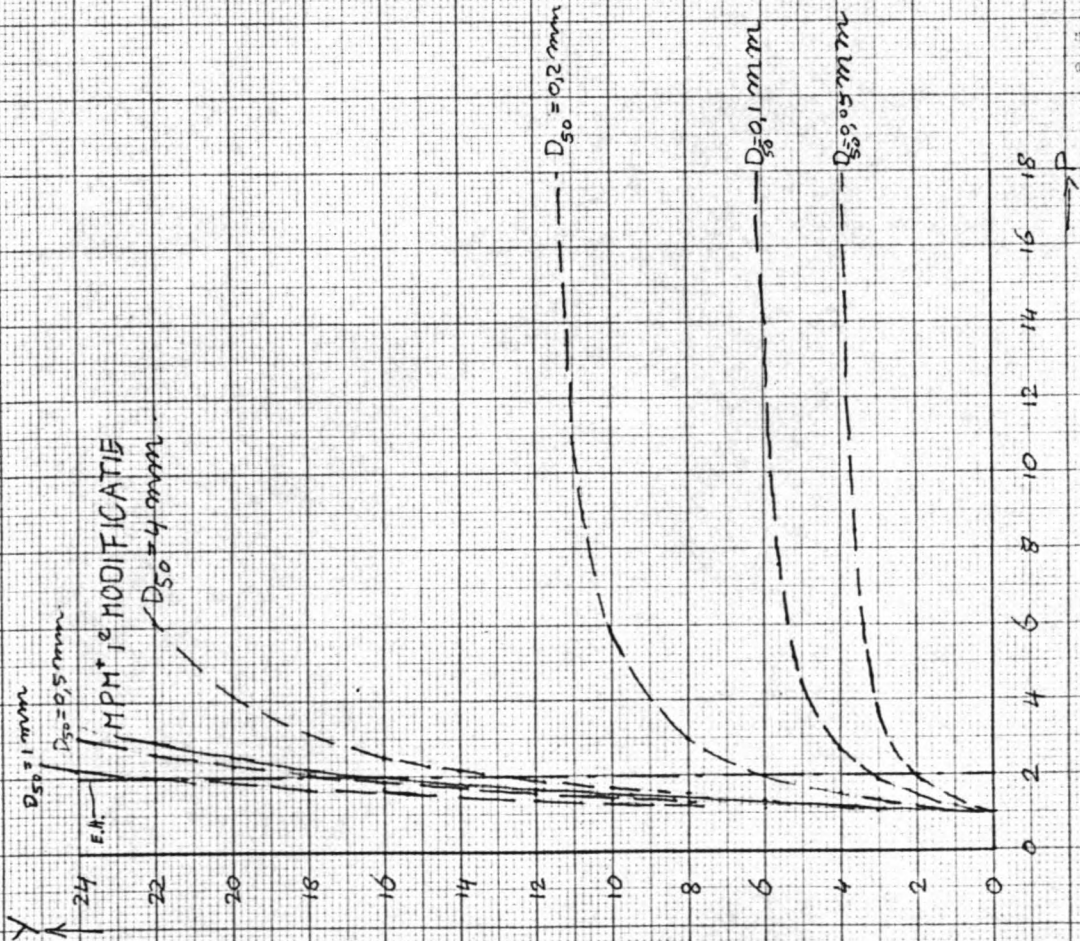
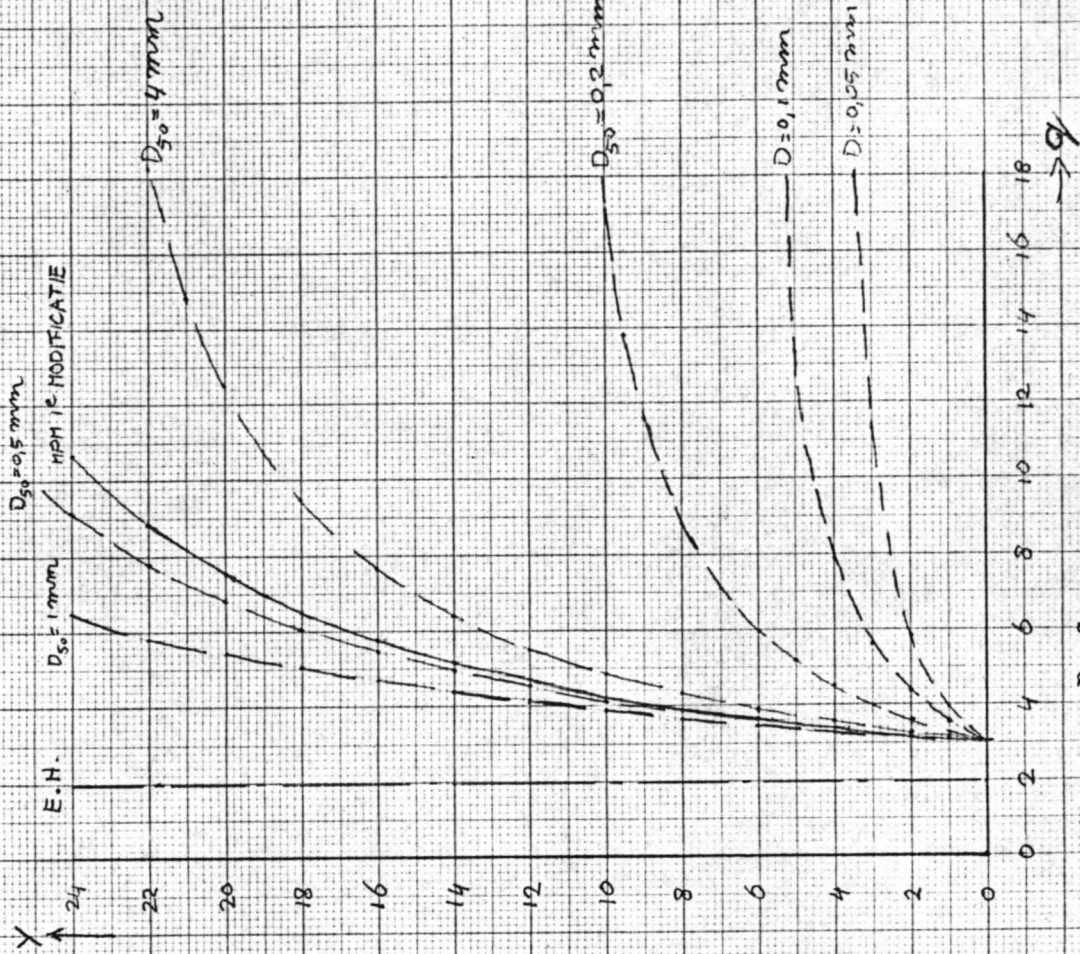


Fig. 4.3 Relatie tussen de exponenten van de machtsformule ($X = aY^p V^q$) en Y, volgens de 1^{ste} en 3^e modificaties van M.P.M.

1^o MODIFICATIE MPM : P 1-0.5V
 3^e MODIFICATIE MPM :

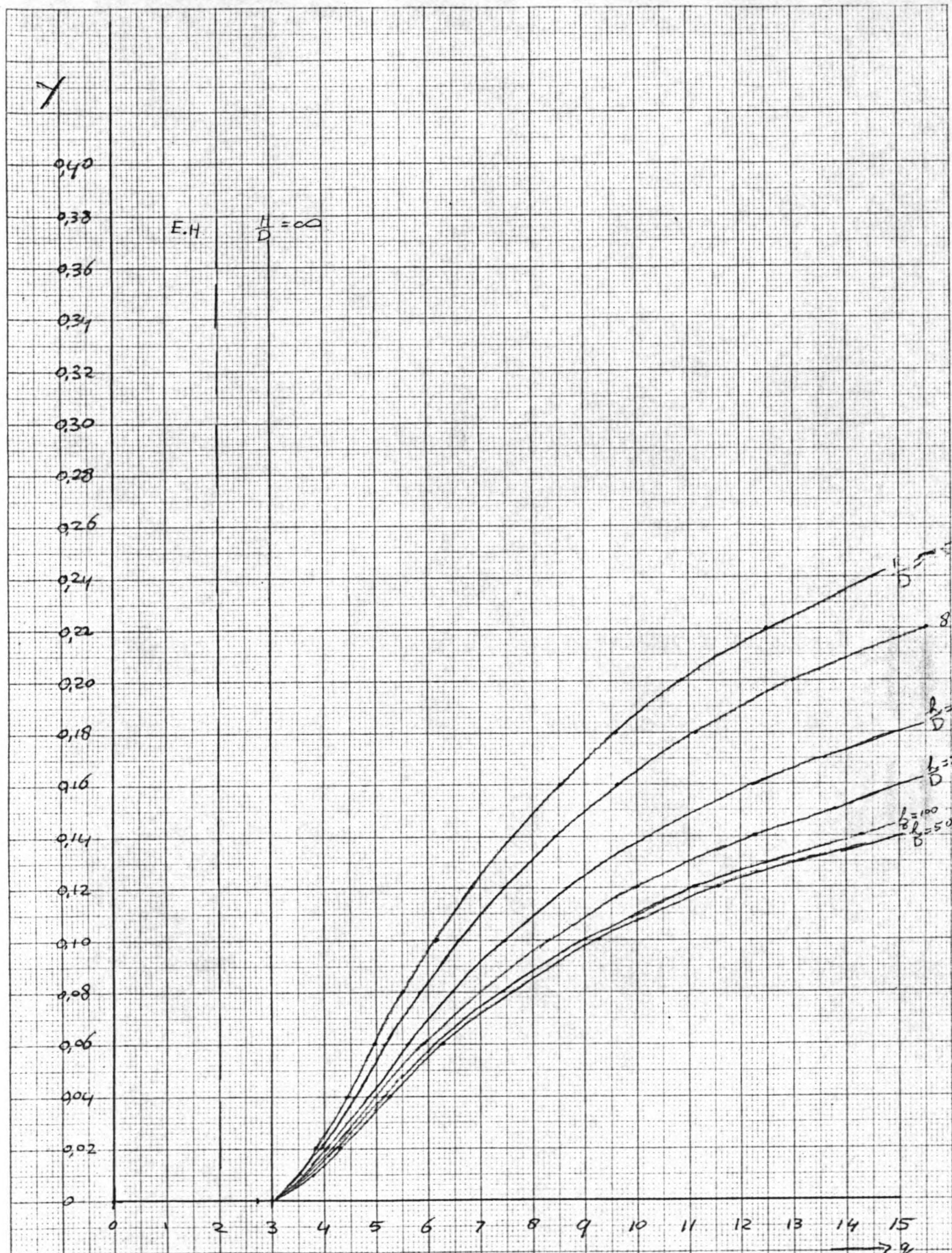


Fig. 4.4 Exponenten van de machtsformule ($X = aY_{v*}^p Y_v^q$) als functie van Y, volgens Rottner.

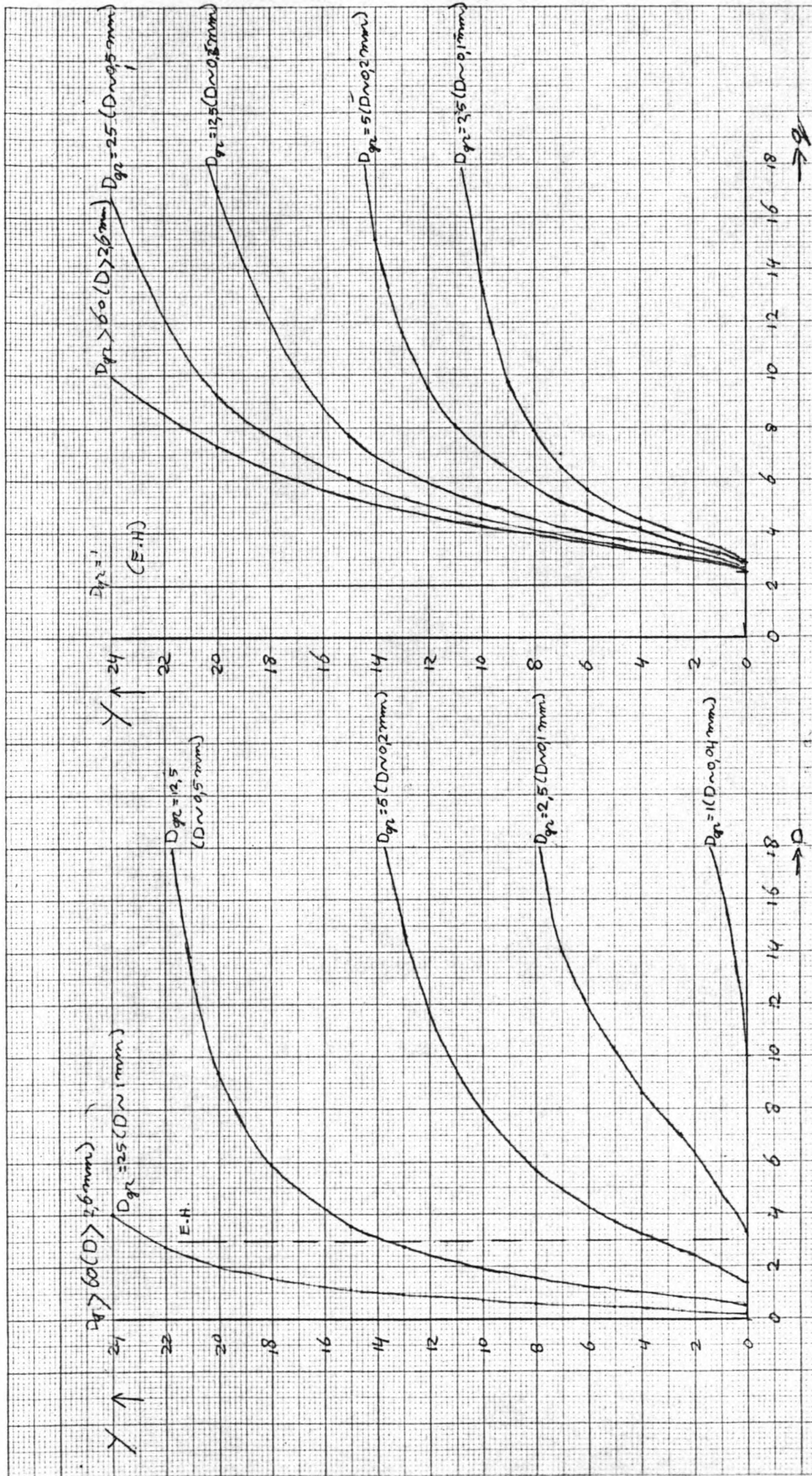


Fig 4.5 Relatie tussen de exponenten van de machtsformule

($X = aY^p Y^q$) en Y , volgens Ackers en White.

HOOFDSTUK 5

Fig. 5.1 t/m 5.15 : Relatie tussen X , Y_{v*} , Y_v en $\frac{R_b}{D_{90}}$ volgens
Engelund Hanssen.

INTERVAL NR 1 : $\frac{R_B}{D_{90}} \leq 7,1$

$$E/H : X = 0,05 Y_{nr}^2 Y_{nr}^3$$

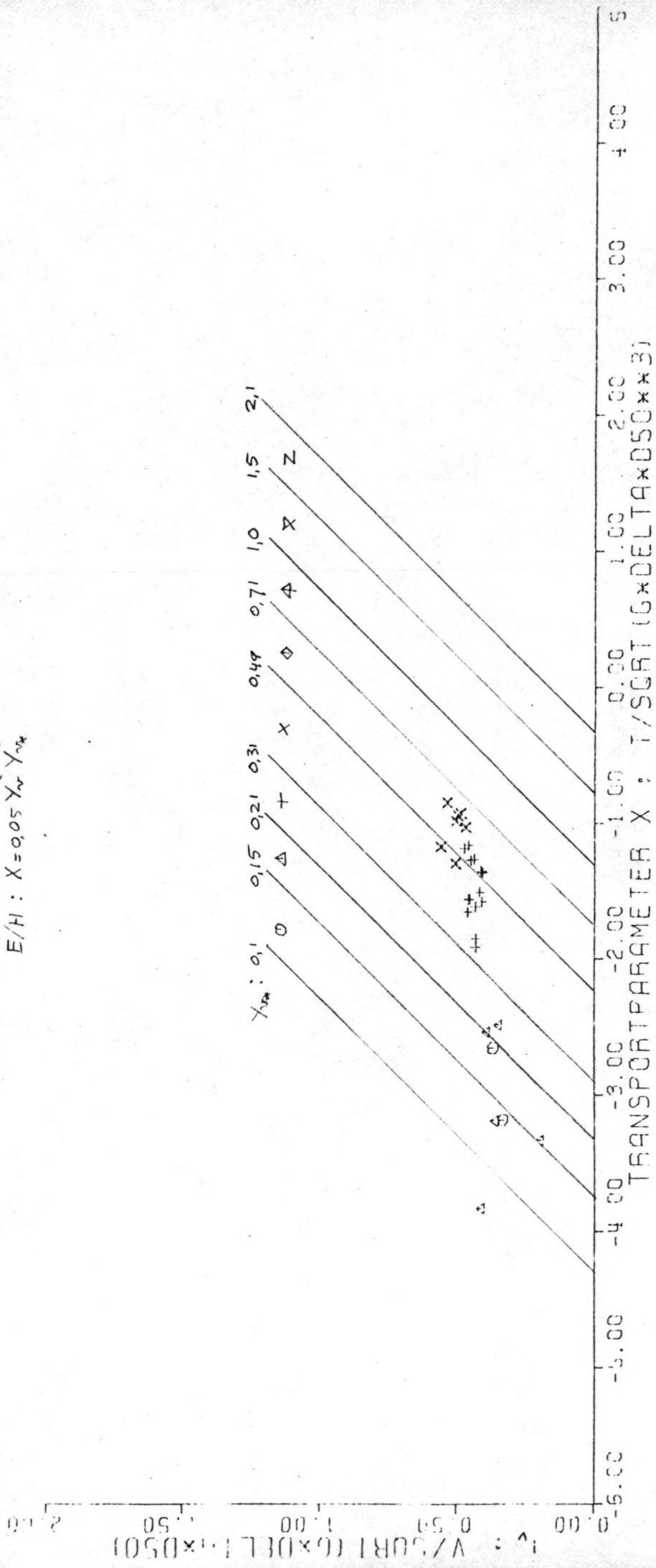


FIG. 5.1

INTERVAL NR 2: $7.1 < \frac{R_B}{D_{90}} \leq 10$

$$E/H: X = 0.05 \gamma_w^2 \gamma_{r*}^3$$

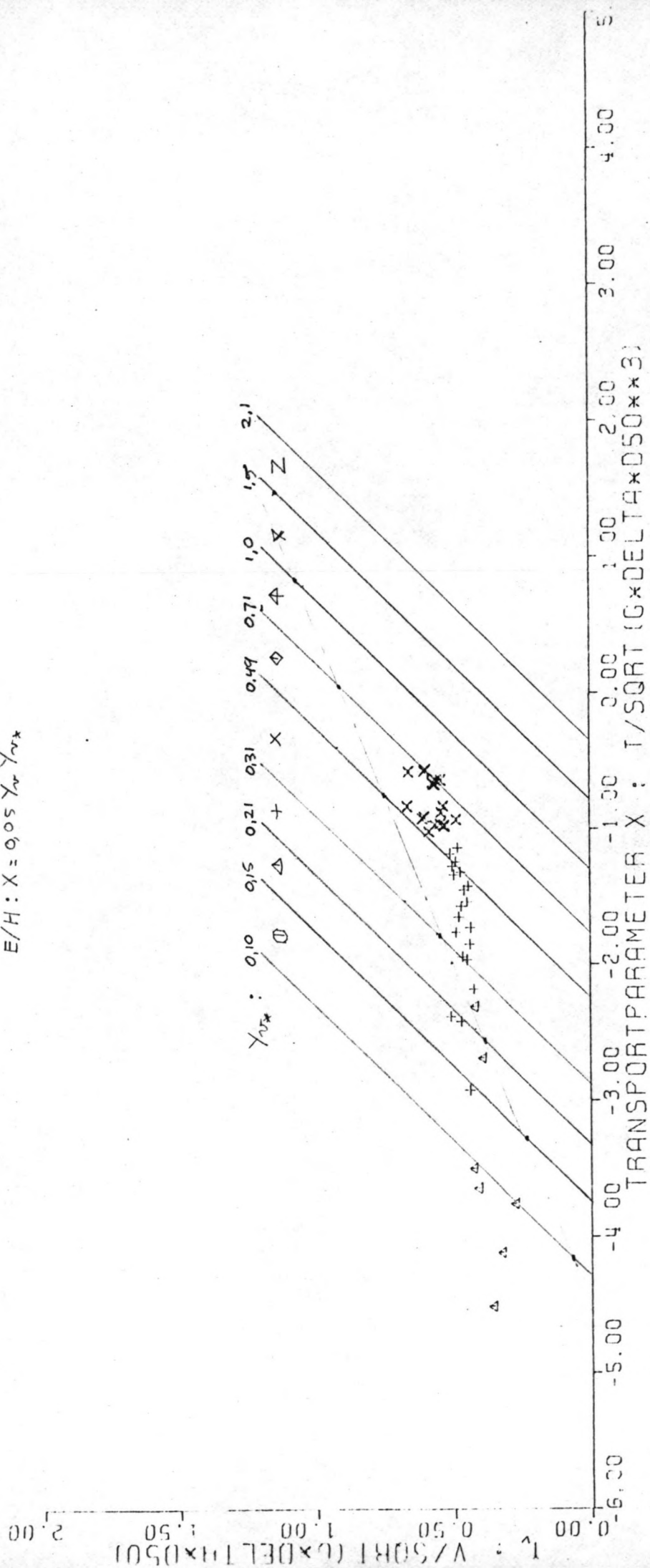


FIG. 5.2

INTERVAL NR 3 : $10 < \frac{R^3}{D_{90}} \leq 15$

$E/H : X = 0.05 Y_{rx}^2 Y_{rx}$

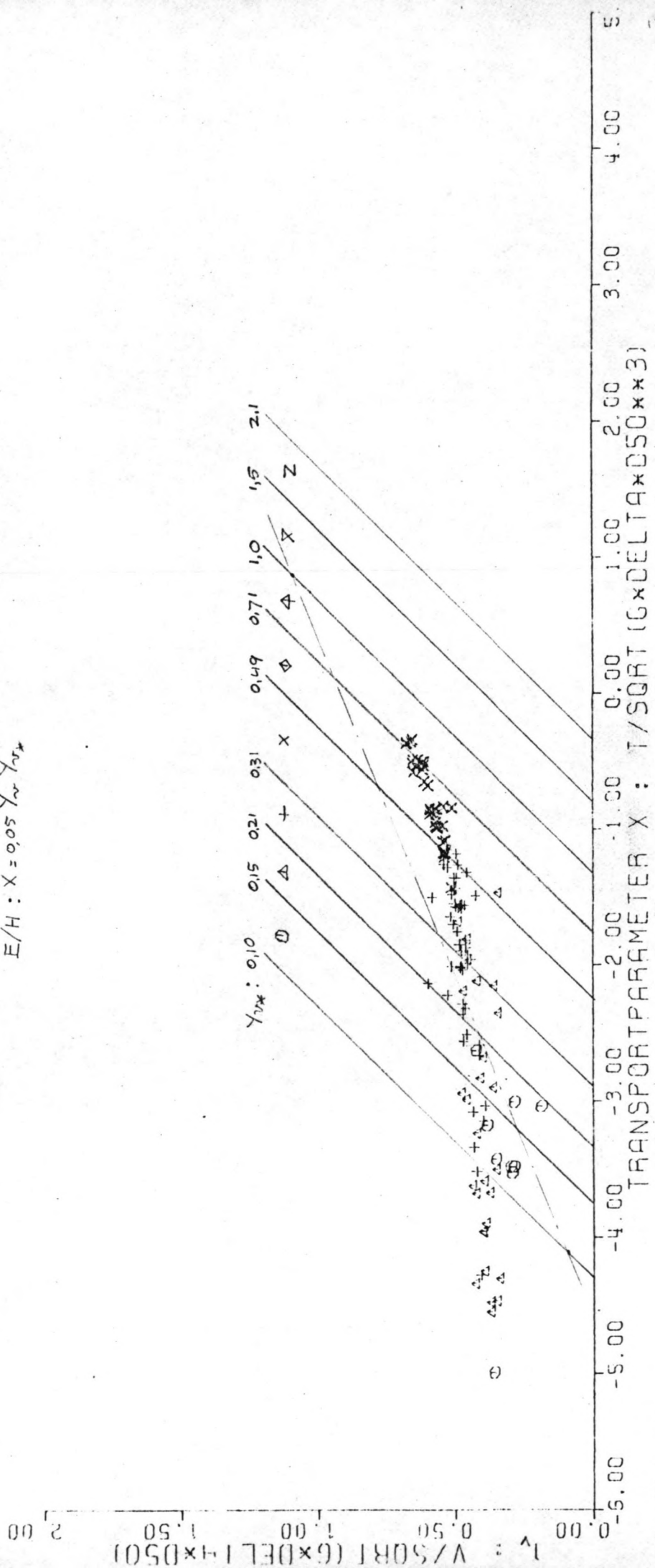


FIG. 5.3

INTERVAL NR 4 : $15 < \frac{R_B}{D_{90}} \leq 21$

$E/H : X = 0.05 Y_r^2 Y_{rx}^3$

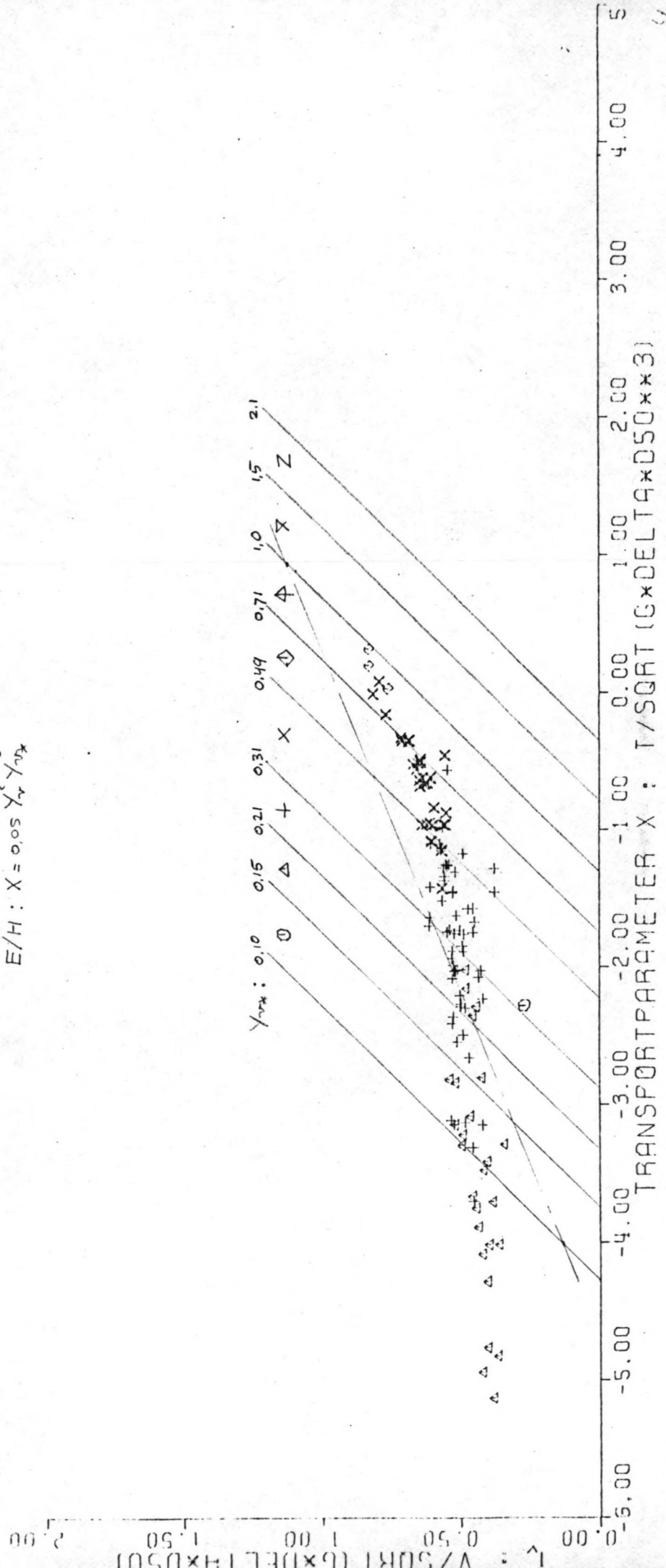


FIG. 5.4

INTERVAL NR 5: $21 < \frac{R_p}{D_{90}} \leq 31$

$$E/H: X = 0.05 Y_r^2 Y_{rx}^3$$

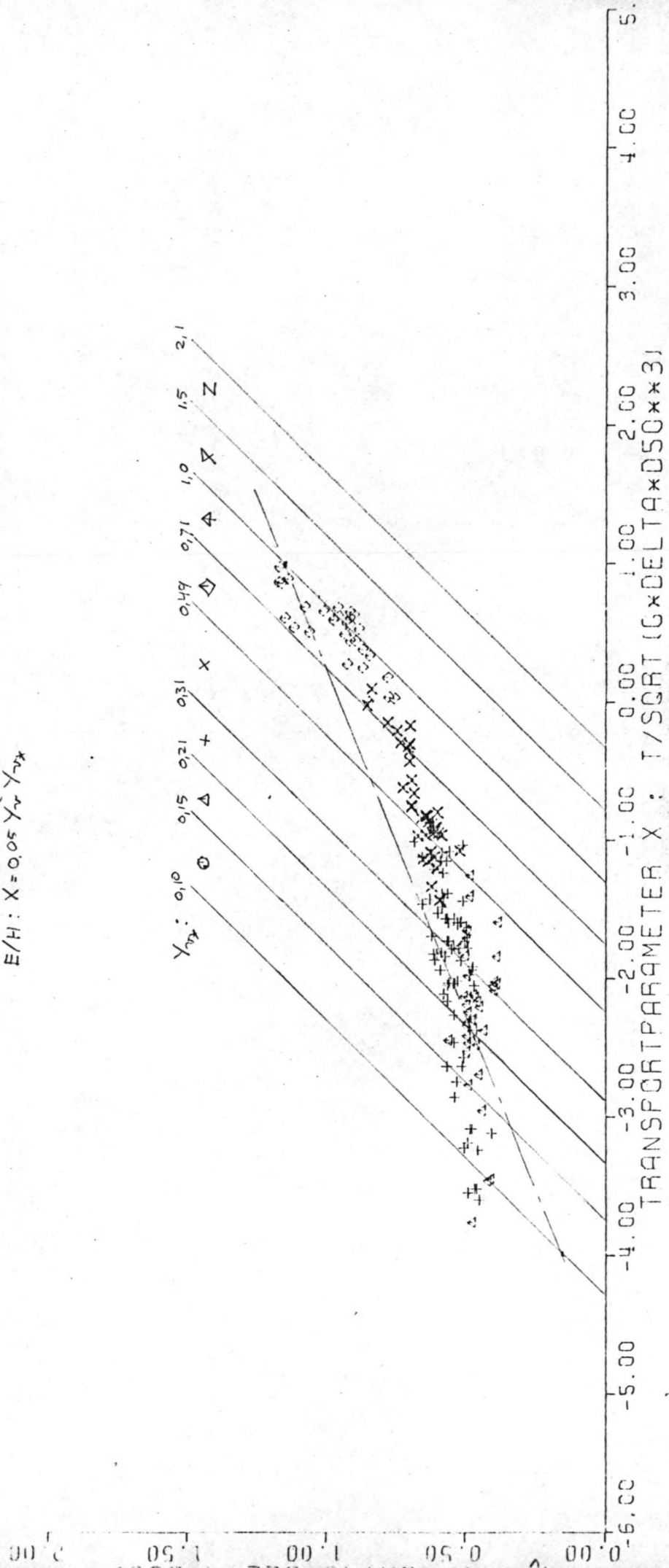


FIG. 5.5

INTERVAL NR 6 : $31 < \frac{R_B}{D_p} \leq 49$

$E/H : X = 0,05 Y_V Y_{max}^2$

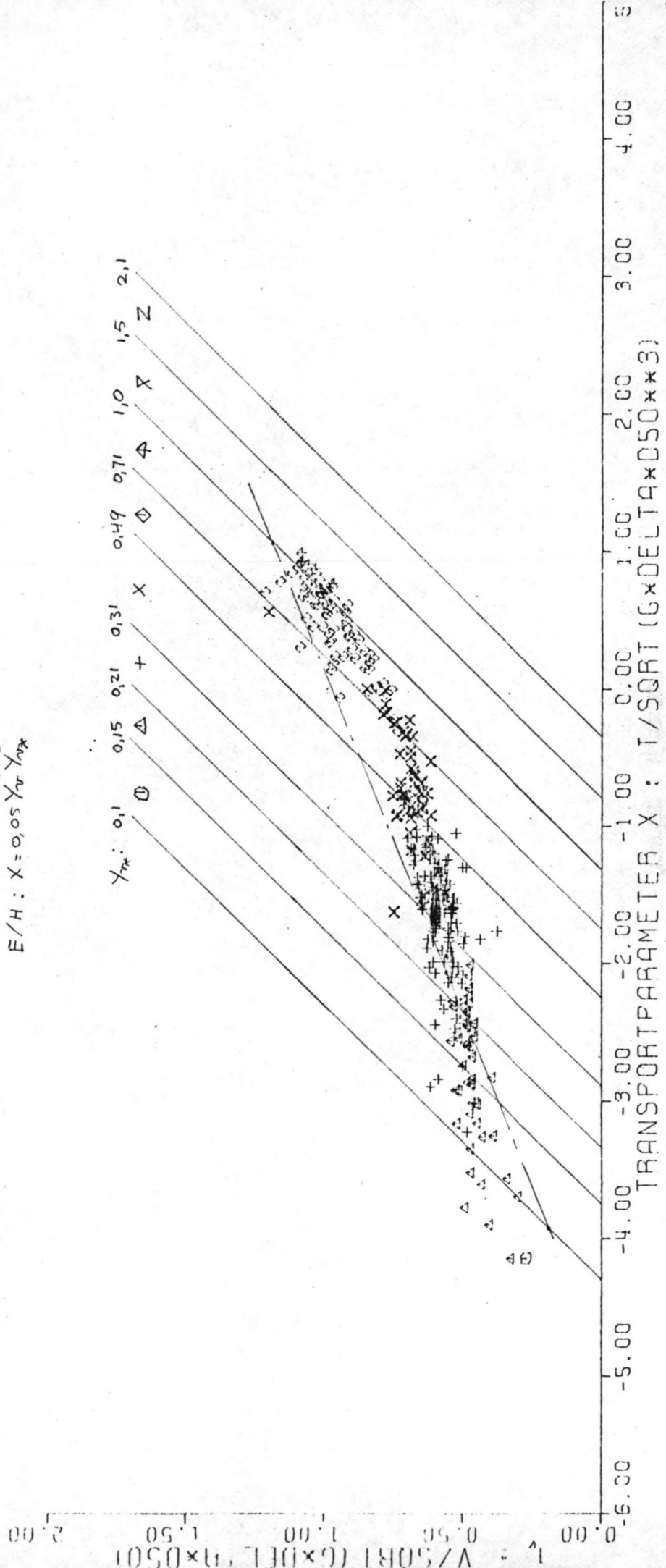


FIG. 5.6

INTERVAL NR 7 : $49 < \frac{R^R}{D_p} \leq 71$

$$E/H : X = 0,05 \sqrt[2]{Y_{rx}}^3$$

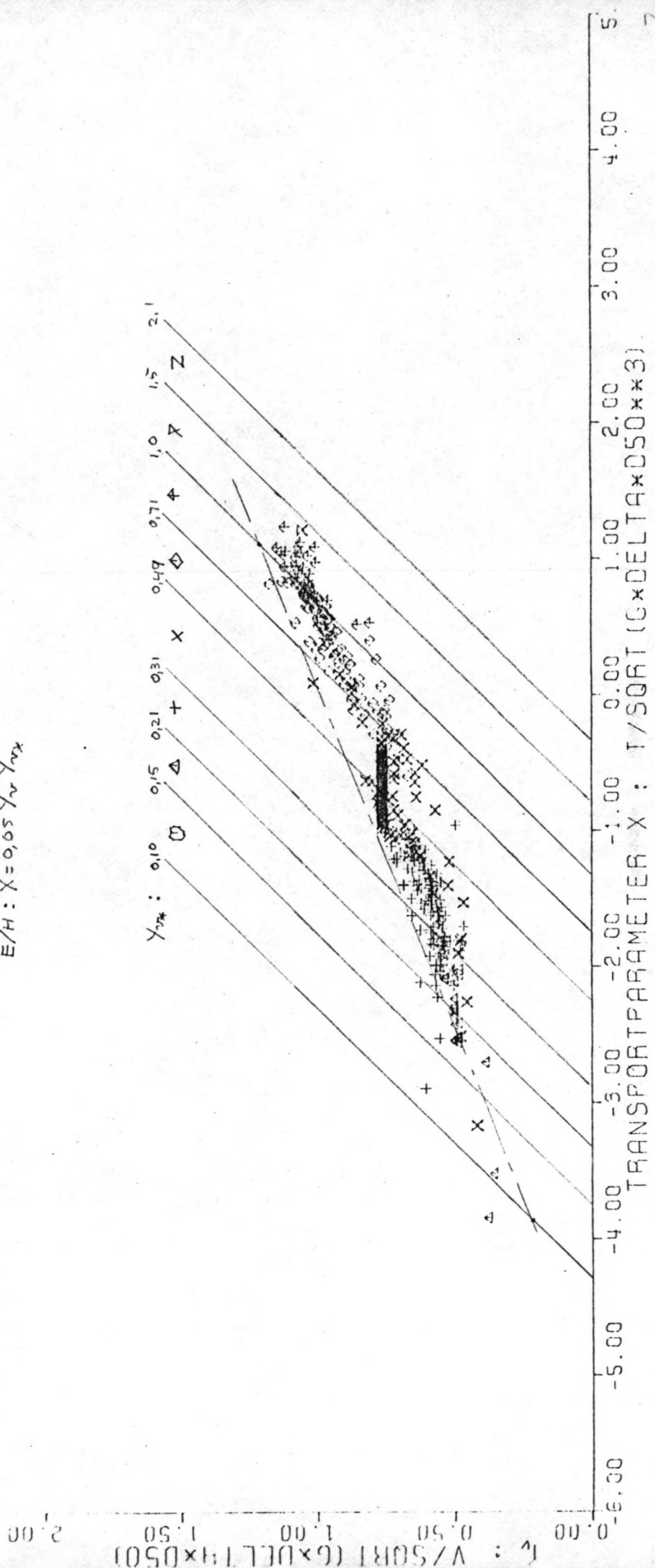


FIG. 5.7

INTERVAL NR 8 : $71 < \frac{R_B}{D_{90}} \leq 100$

$E/H : X = 0.05 Y_4^2 Y_{7K}^3$

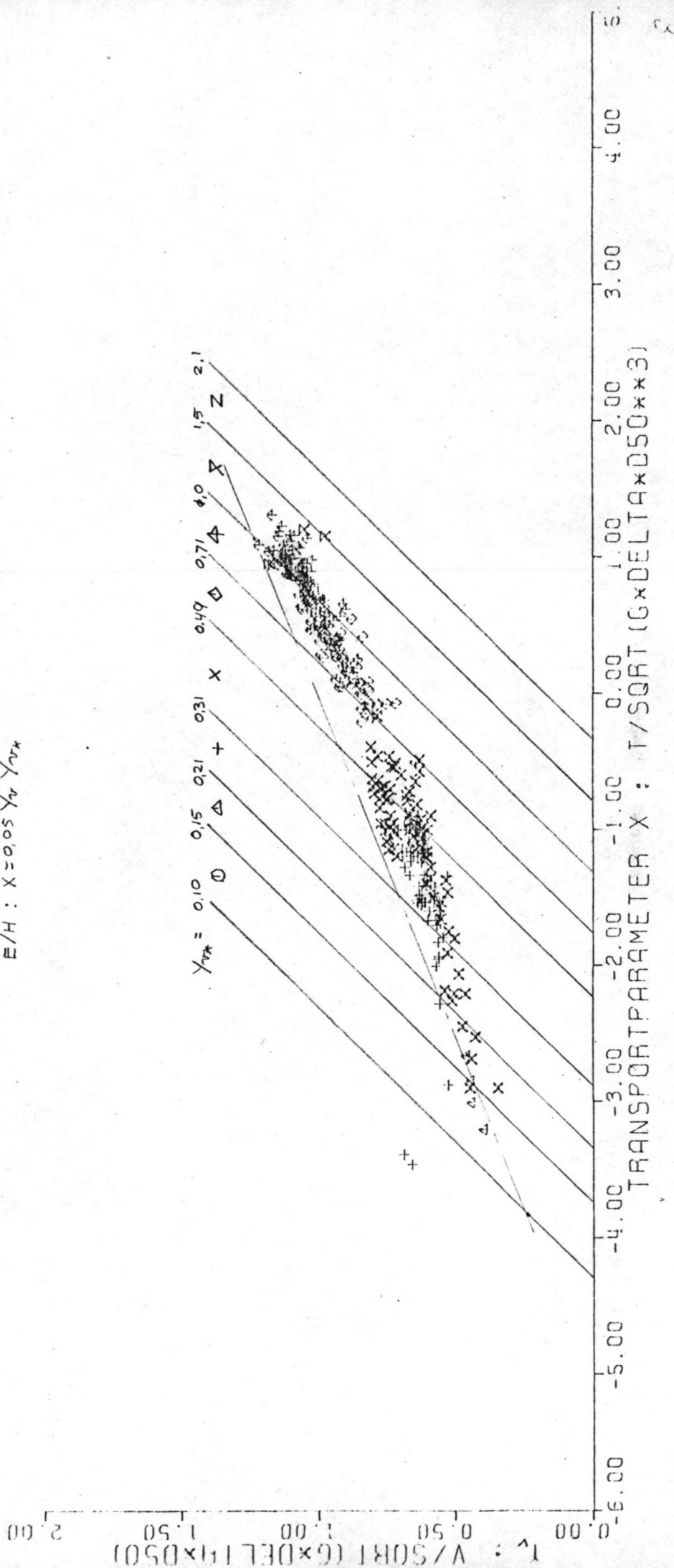


FIG. 5.8

INTERVAL NR 9 : $100 < \frac{R_B}{D_{90}} \leq 150$

$$E/H \quad X = 0,05 Y_{14} Y_{15}^2$$

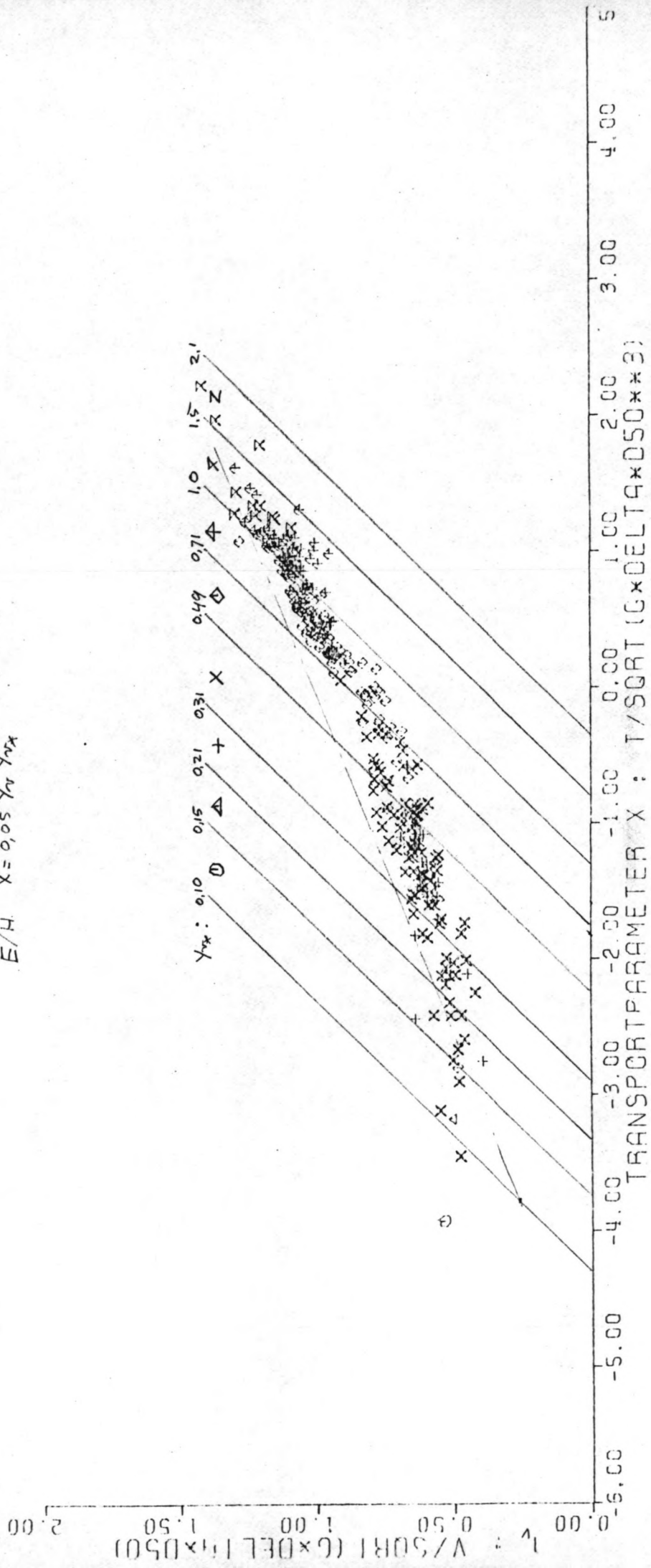


FIG. 5.9

INTERVAL NR 10 : $150 < \frac{RB}{D_{90}} < 210$

$E/H : X = 0,05 Y_v^2 Y_{0X}^3$

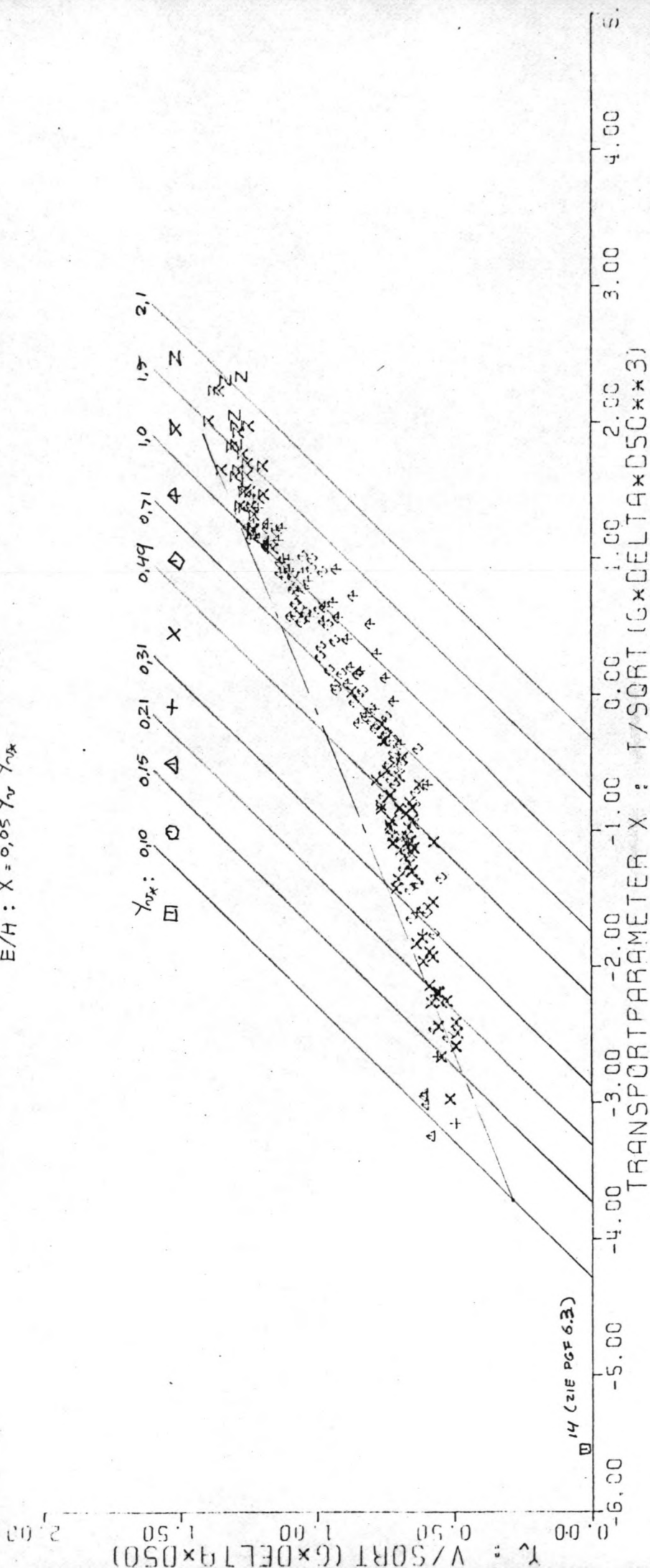


FIG. 5.10

INTERVAL NR 11 : $210 < \frac{R_B}{D_p} \leq 310$

$E/H : X = 0,05 Y_{\text{max}}^3$

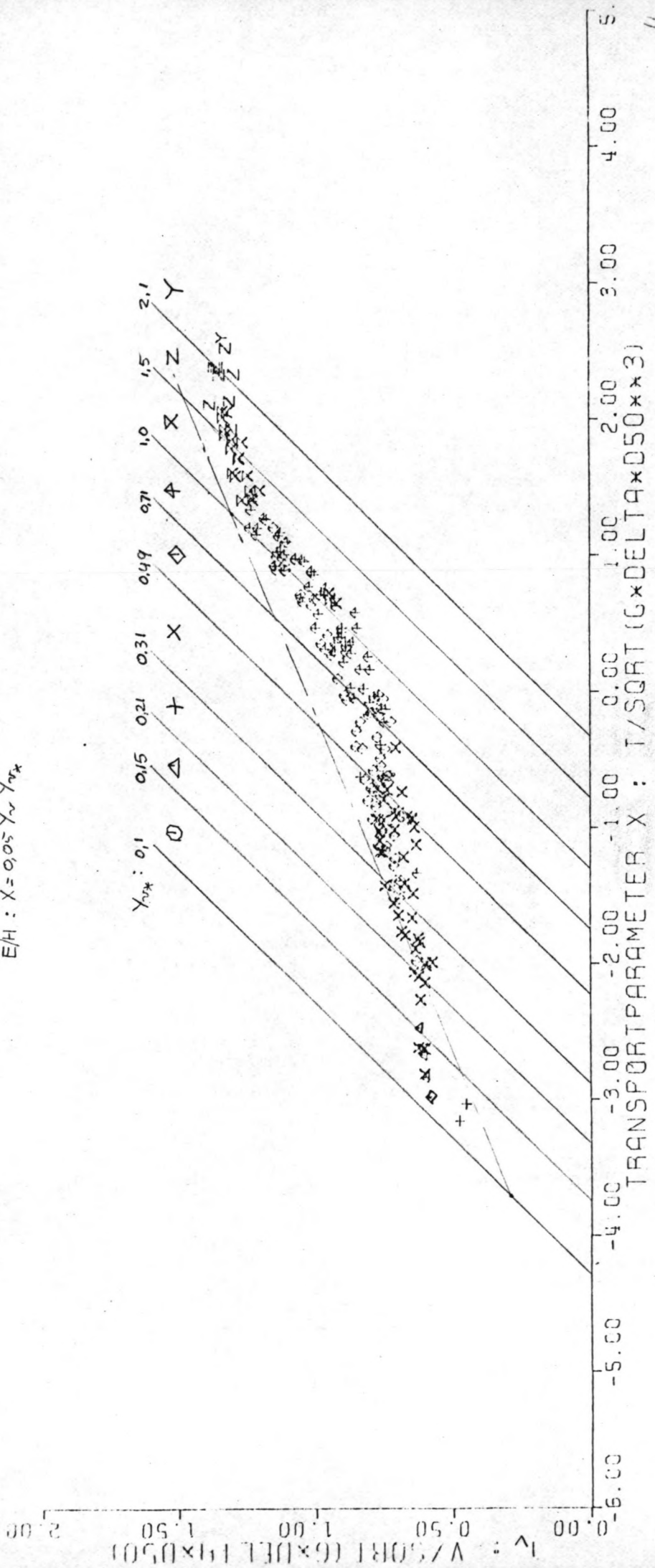


FIG. 5.11

INTERVAL NR 12 : $310 < \frac{R_B}{D_{90}} \leq 490$

$E/H : X = 0,05 \cdot Y_{0,2}^3$

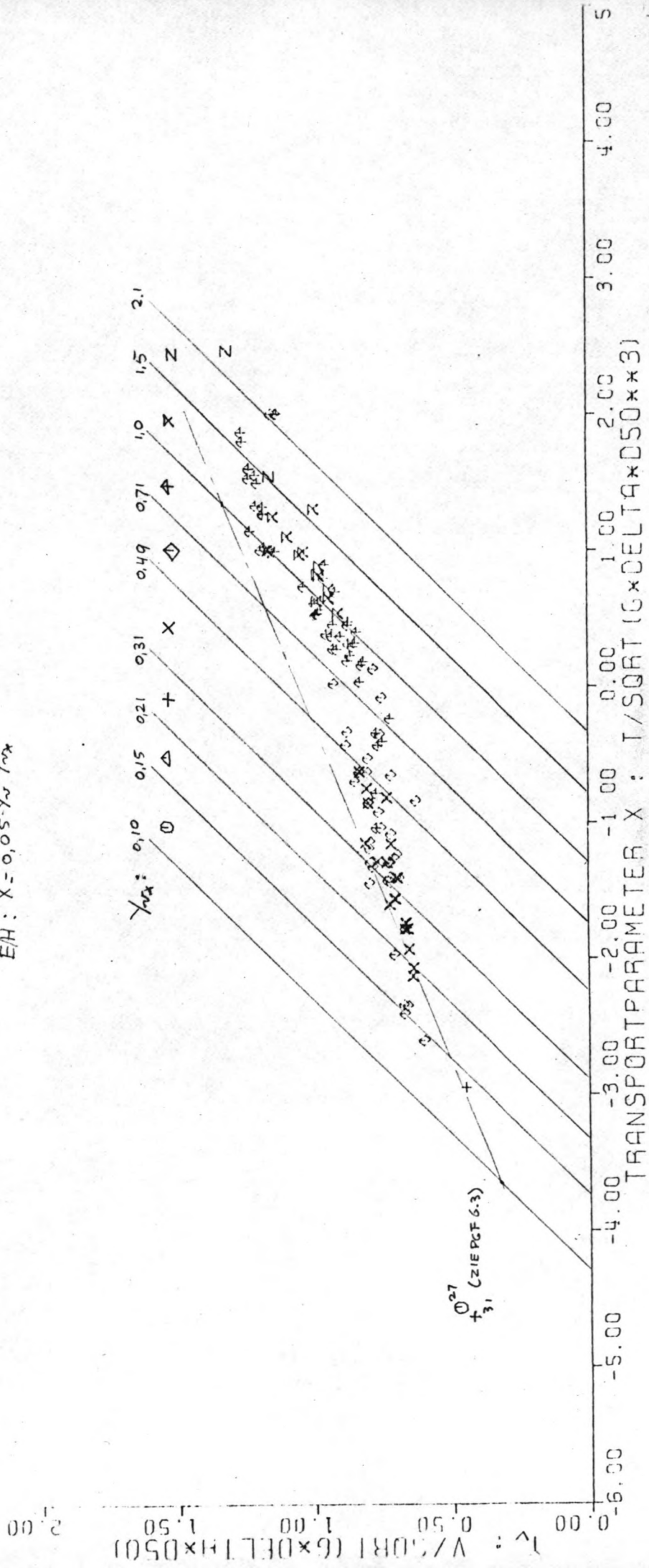


FIG 5.12

INTERVAL NR 13: $490 < \frac{RB}{D_{90}} \leq 710$

$E/H: X = 0,05 Y_w^2 Y_{rx}^3$

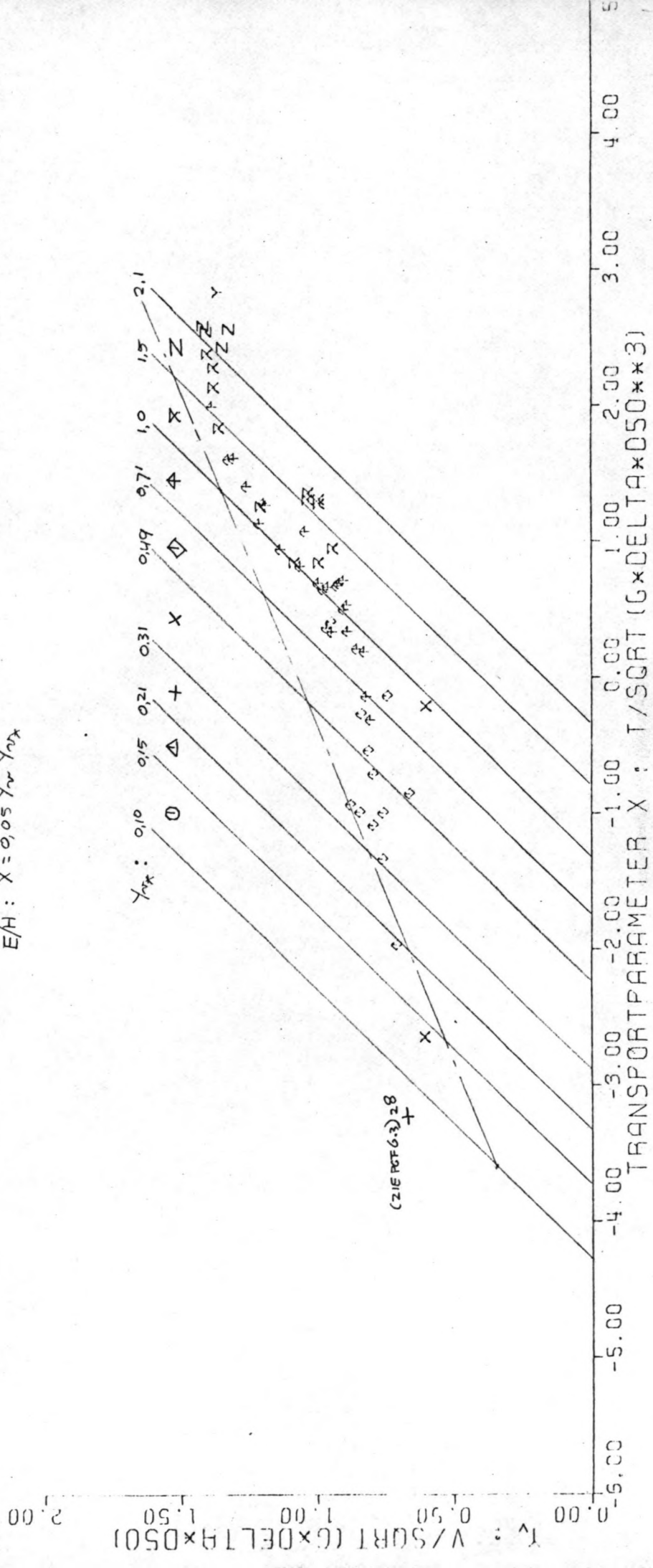


FIG. 5.13

INTERVAL NR 14 : $710 < \frac{R_B}{D_{90}} \leq 1000$

$\Xi/H : X = 0,05 Y_{nr}^2 Y_{nr}$

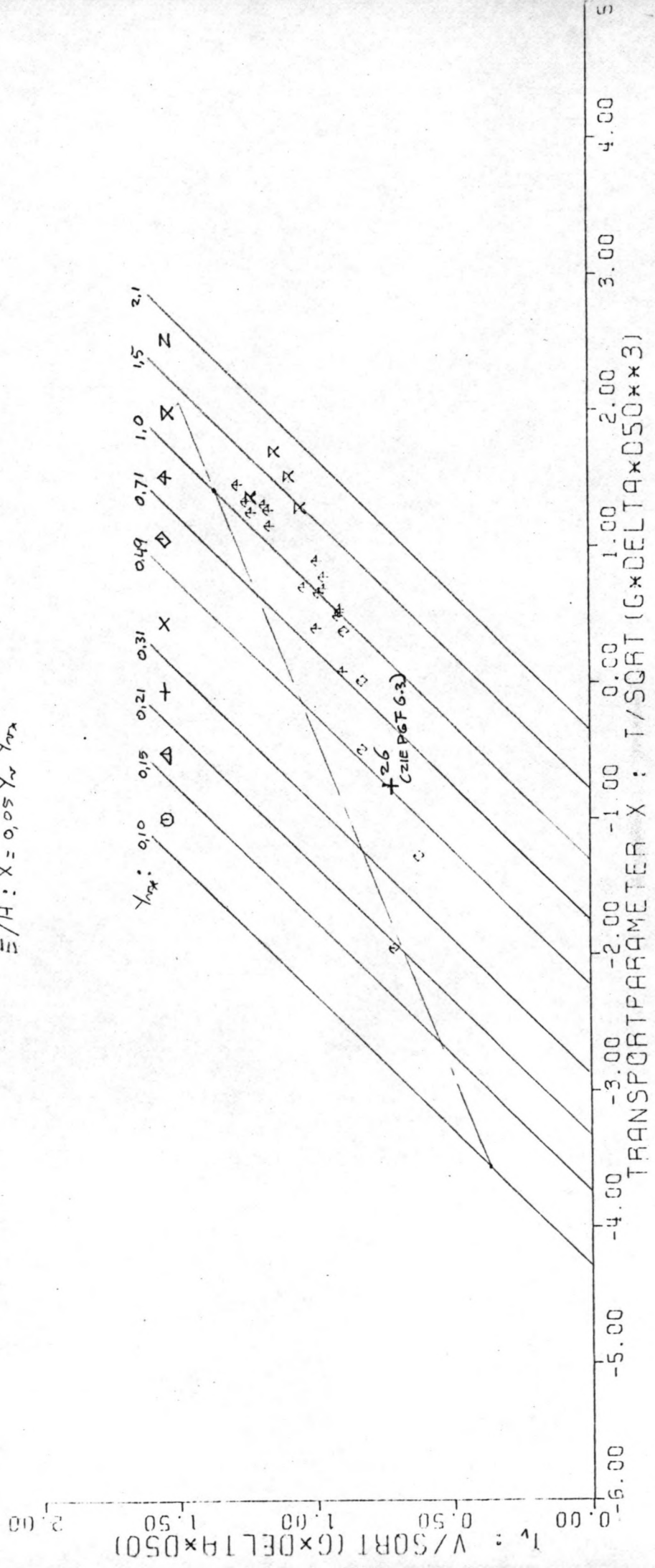


FIG. 5.14

INTERVAL NR 15: $\frac{R_B}{D_{90}} > 1000$

$$E/H: X = 0,05 Y_V Y_{rx}^3$$

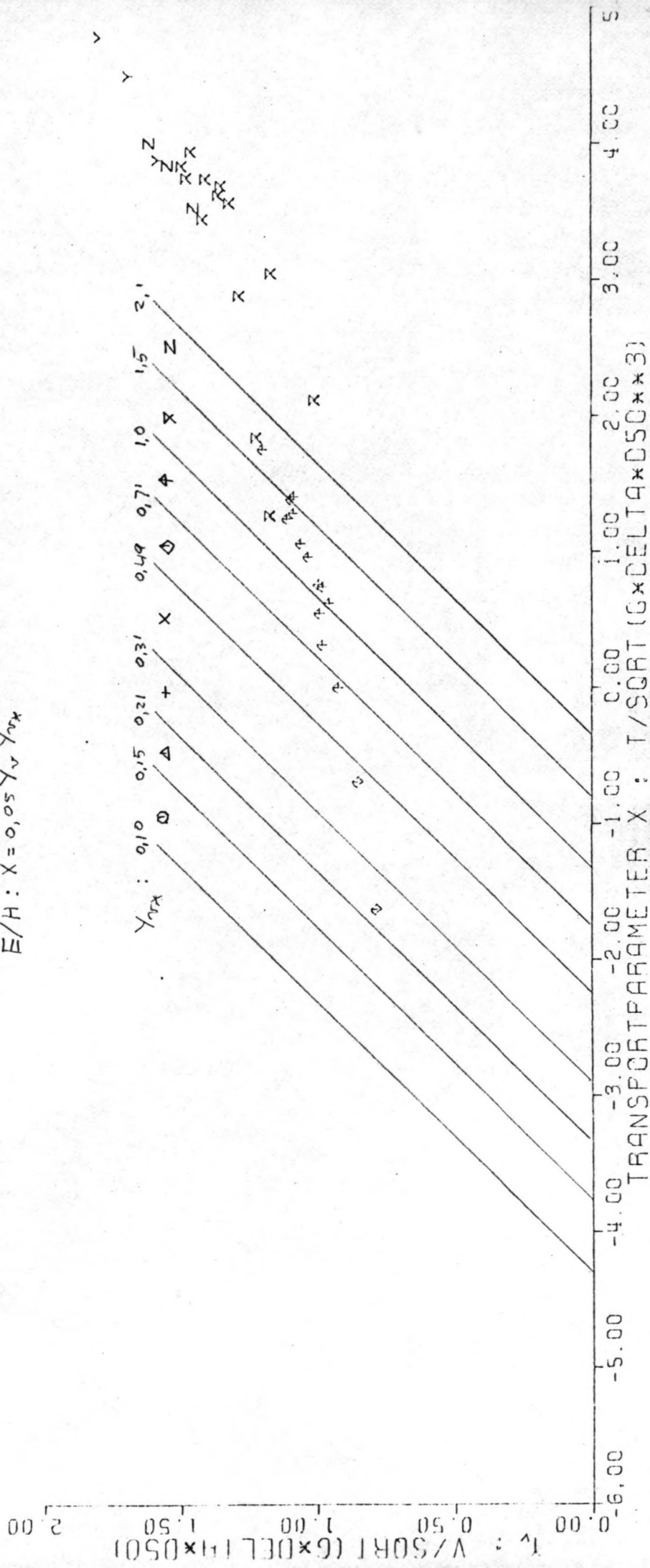


FIG. 5.15

Fig. 5.16 t/m 5.30 : Relatie tussen X , Y_{v*} , Y_v en $\frac{h}{D_{90}}$ volgens
Engelund Hanssen.

INTERVAL R1: $\frac{k}{D_{90}} < 7.11$

E.H.: $X = 0.05 \gamma_{v*}^2 \gamma_w$

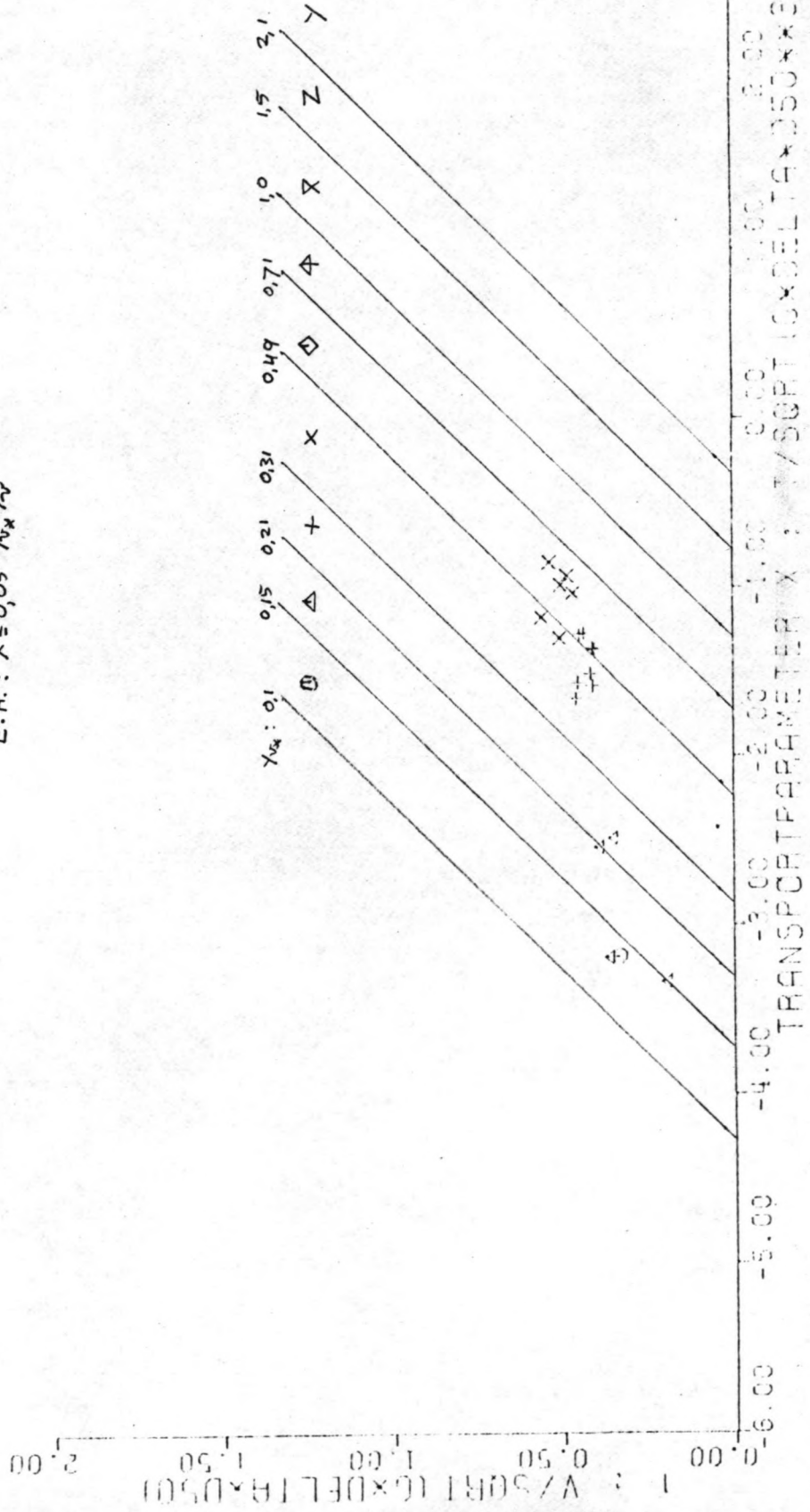


FIG. 5.16

INTERVAL NR 2: $7.1 < \frac{h}{D_{90}} \leq 10$

E.H.: $X = 0.05 X_{0.05}^3 Y^2$

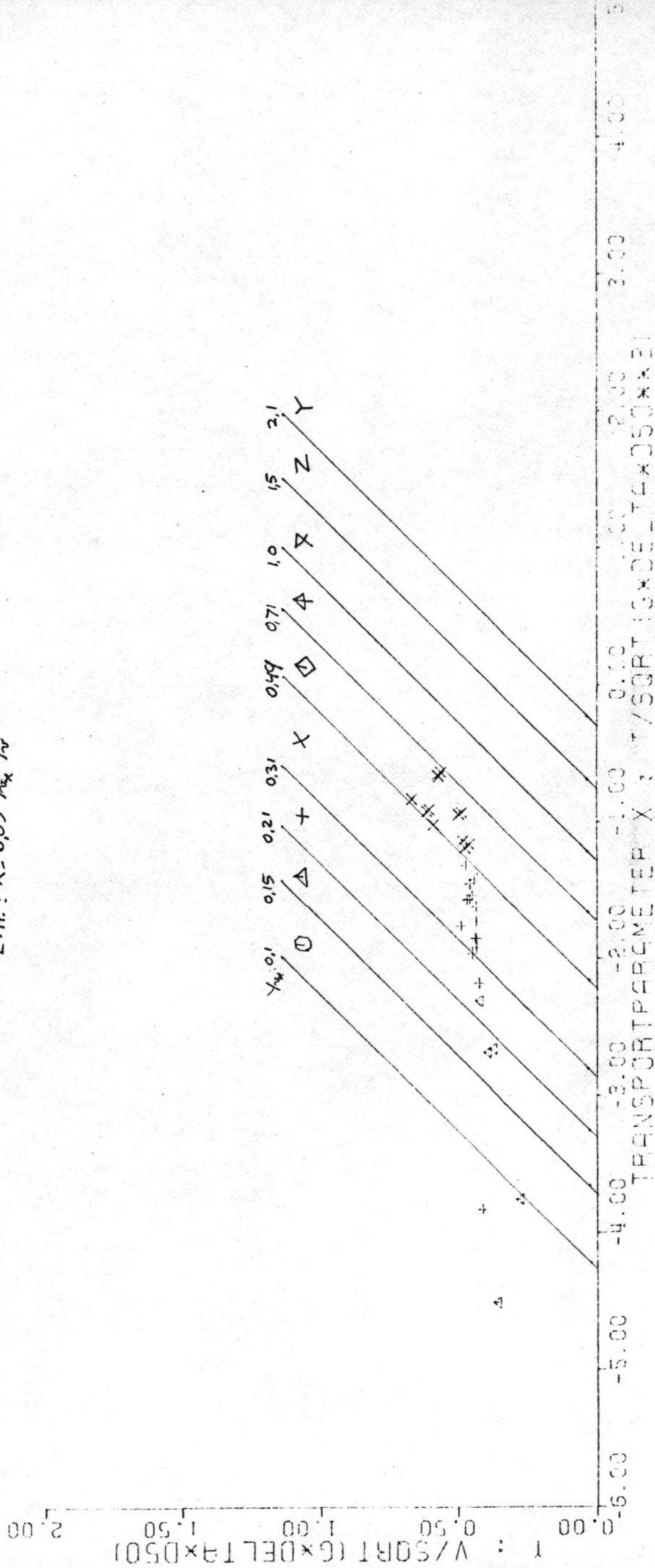


FIG. 5.17

INTERVAL 3 : $10 < \frac{L}{D_{90}} \leq 15$

E.H. : $X = 0,05 \gamma_{Nk}^2 \gamma_v^2$

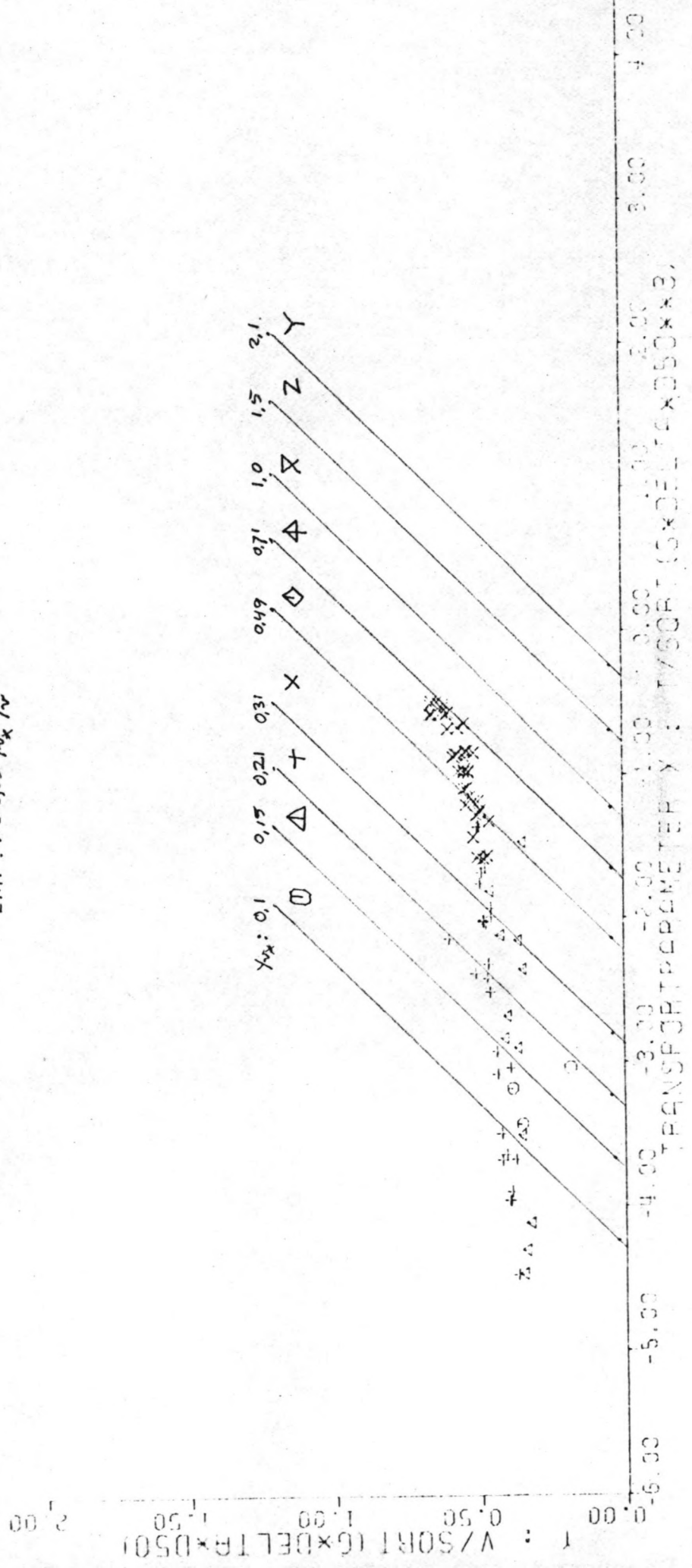


FIG. 5.18

INTERVAL 4 : $15 < \frac{R}{D_{90}} \leq 21$

E.H. : $X = 0.05 Y_{10}^2 Y_{20}^2$

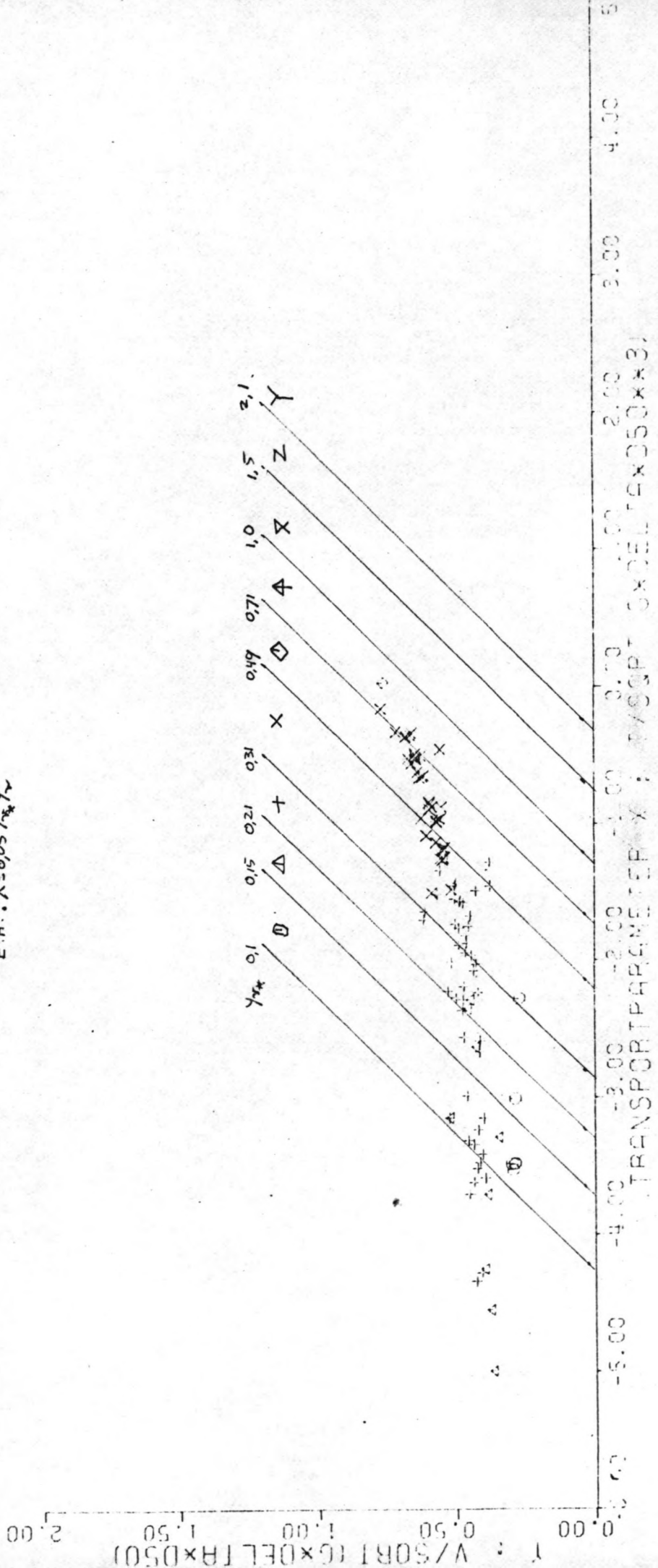


FIG. 519

INTERVAL 5 : $21 < \frac{R}{D_{90}} \leq 31$

E.H. : $X = 0.05 Y_{75}^3 Y_w^2$

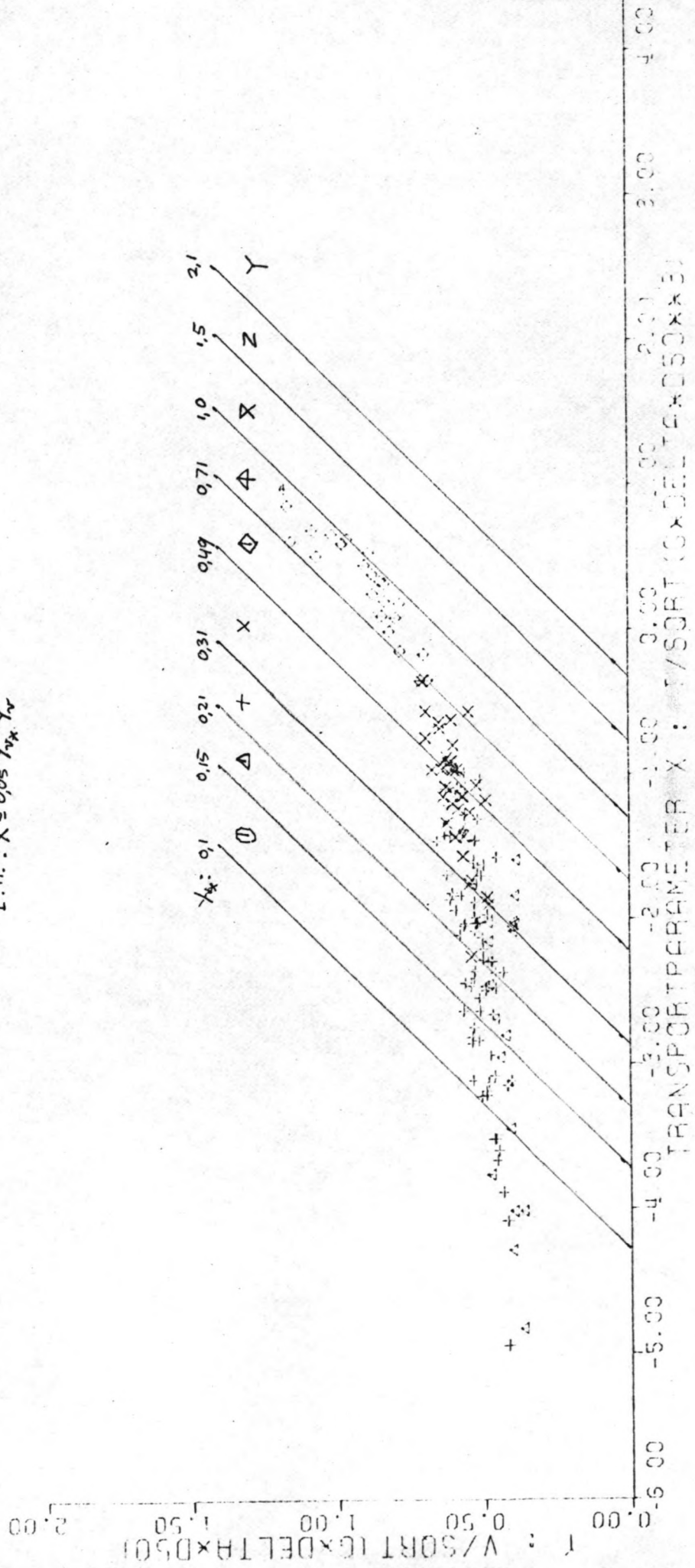


FIG 5.20

INTERVAL σ : 31 < $\frac{\sigma}{\sigma_0}$ < 49

E. H. : $X = 0,05 X_{\sigma}^2 X_{\sigma}^2$

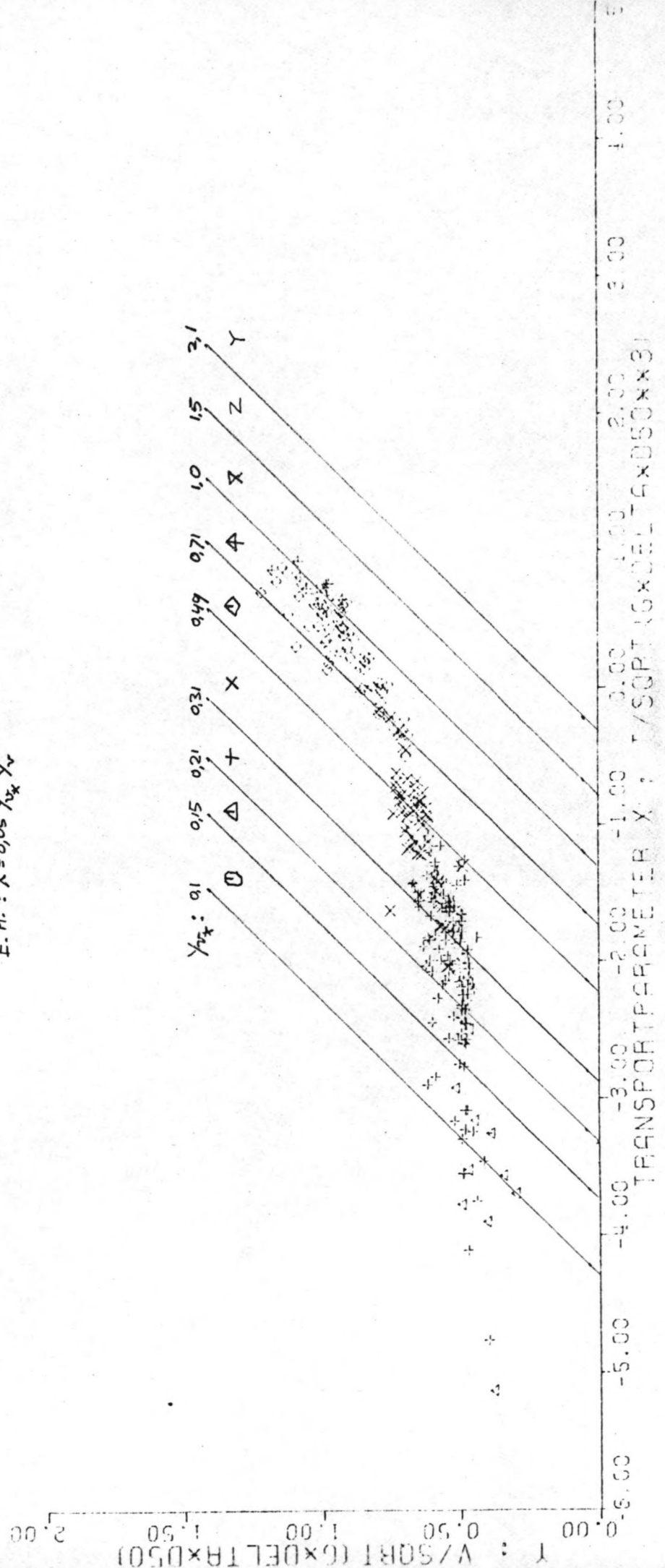


FIG 5.21

INTERVAL 7 : $49 < \frac{L}{D_{90}} \leq 71$

E.H. : $X = 0.05 Y_{TX}^3 X_{\sim}^2$

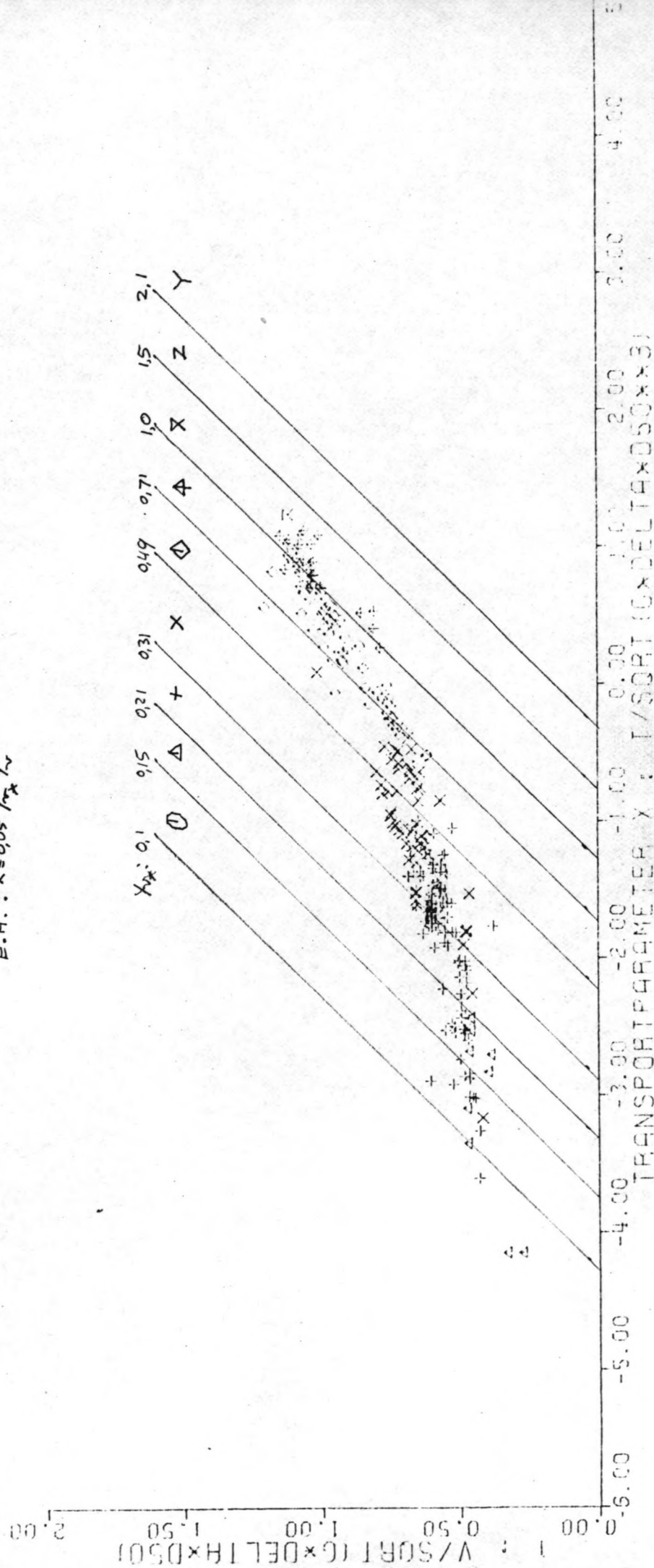


FIG 5.22

INTERVAL 8 : $71 < \frac{L}{D_{90}} \leq 100$

E.H. : $X = 0,05 Y_{10}^2 Y_w$

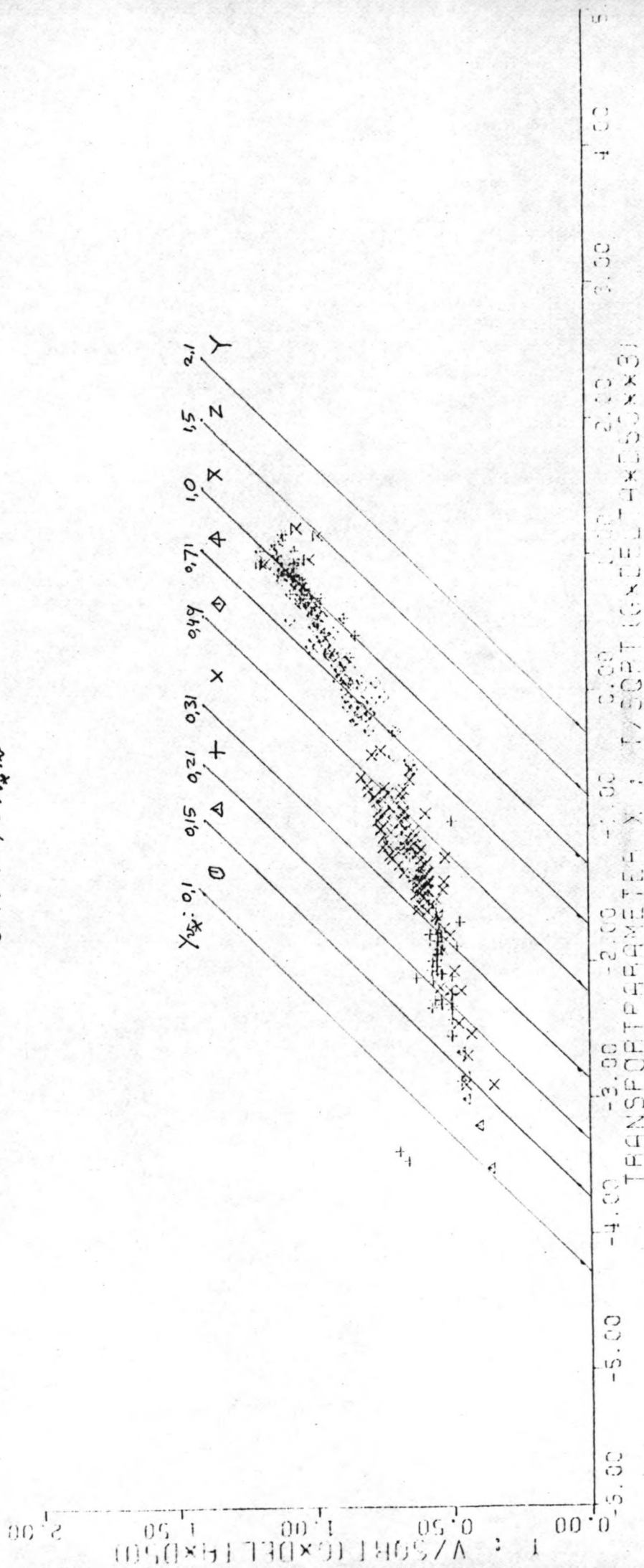


FIG 5.23

INTERVAL $q : 100 \times \frac{R_B}{D_{90}} \leq 150$

EH : $X = 0,05 Y_{0,1} Y_{0,2} Y_{0,3} Y_{0,4}$

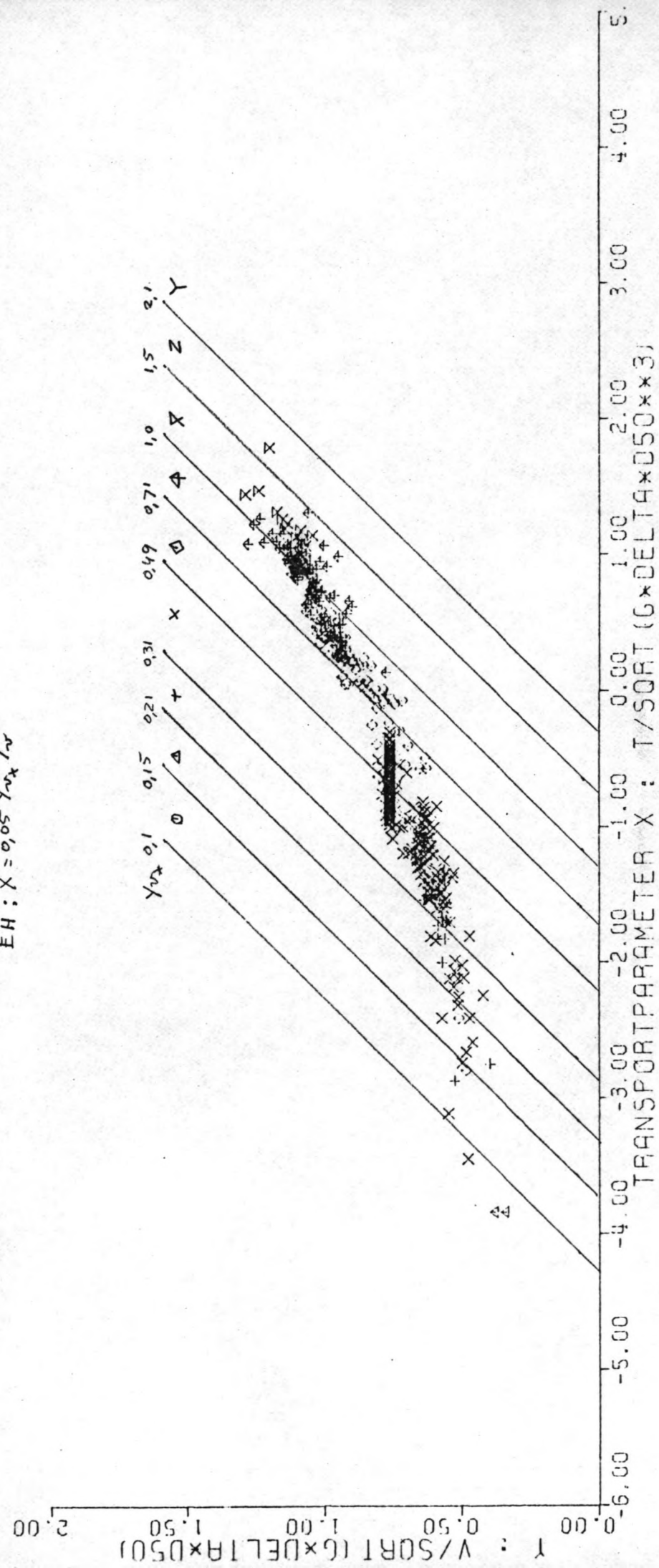


FIG 5.24

INTERVAL 10 : $150 < \frac{L}{D_p} \leq 210$

EH : $X = 0.05 Y_{1X}^3 Y_{2X}^2$

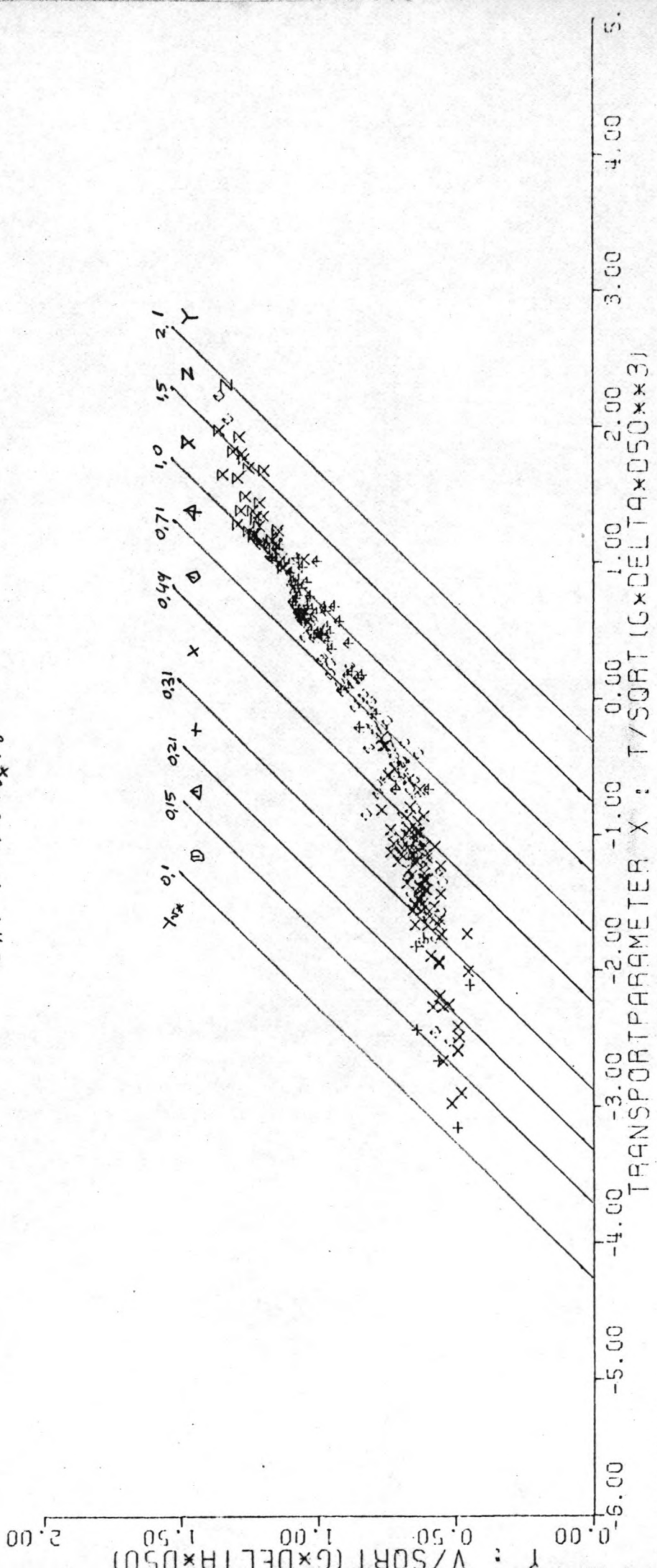


FIG. 5.25

INTERVAL II : $210 < \frac{L}{D_{90}} \leq 310$

E.H. : $X = 0.05 Y_{1/2}^3 Y_w^2$

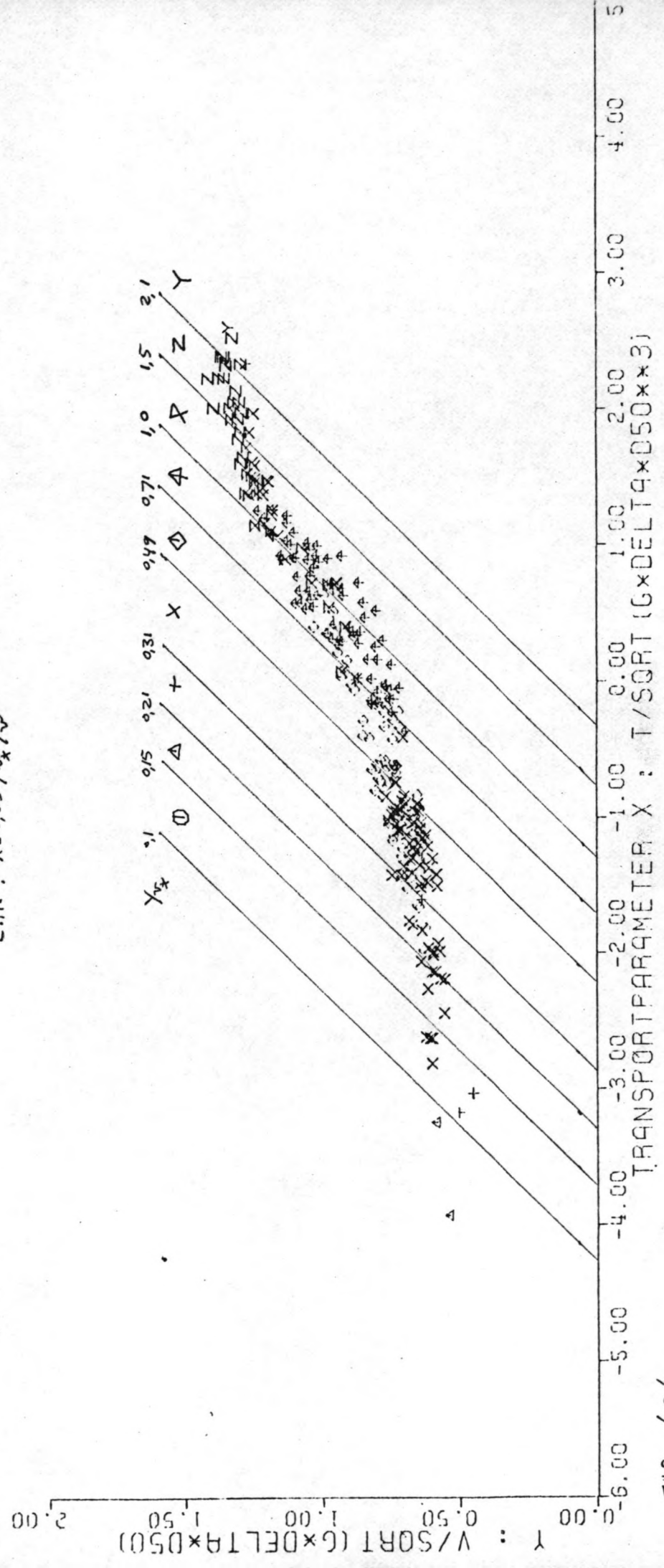


FIG. 6.26

INTERVAL 12 : $310 < \frac{L}{D_p} \leq 490$

E.H. $X = 0.05 Y_{2X}^3 Y_{10}^2$

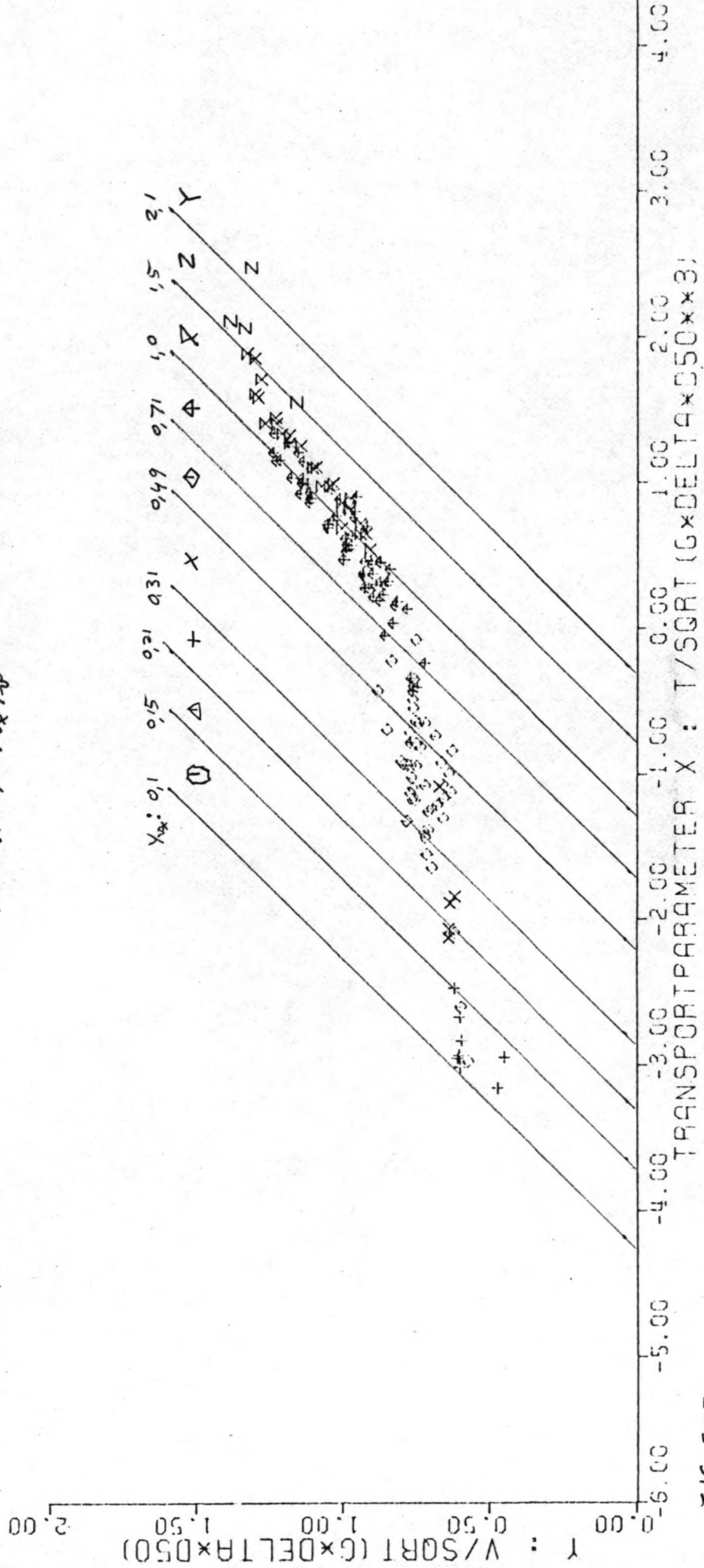


FIG. 6.27

INTERVAL 13 : $490 < \frac{R}{D_{90}} \leq 710$

E.H: $X = 0.05 Y_{10}^2 Y_{50}^2$

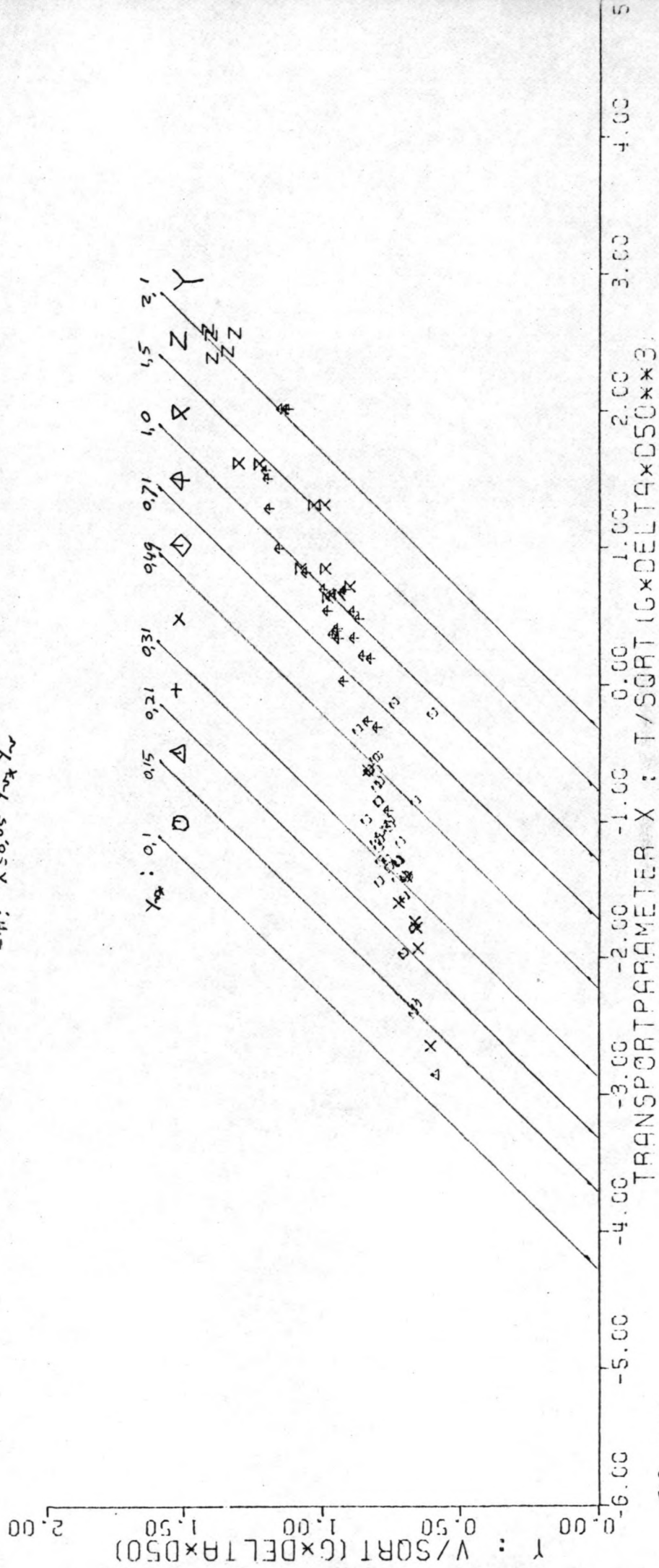


FIG. 5.28

INTERVAL 14 : $710 < \frac{L}{D_p} \leq 1000$

E.H. : $X = 0.05 \gamma_{\text{max}}^2 \gamma_r^2$

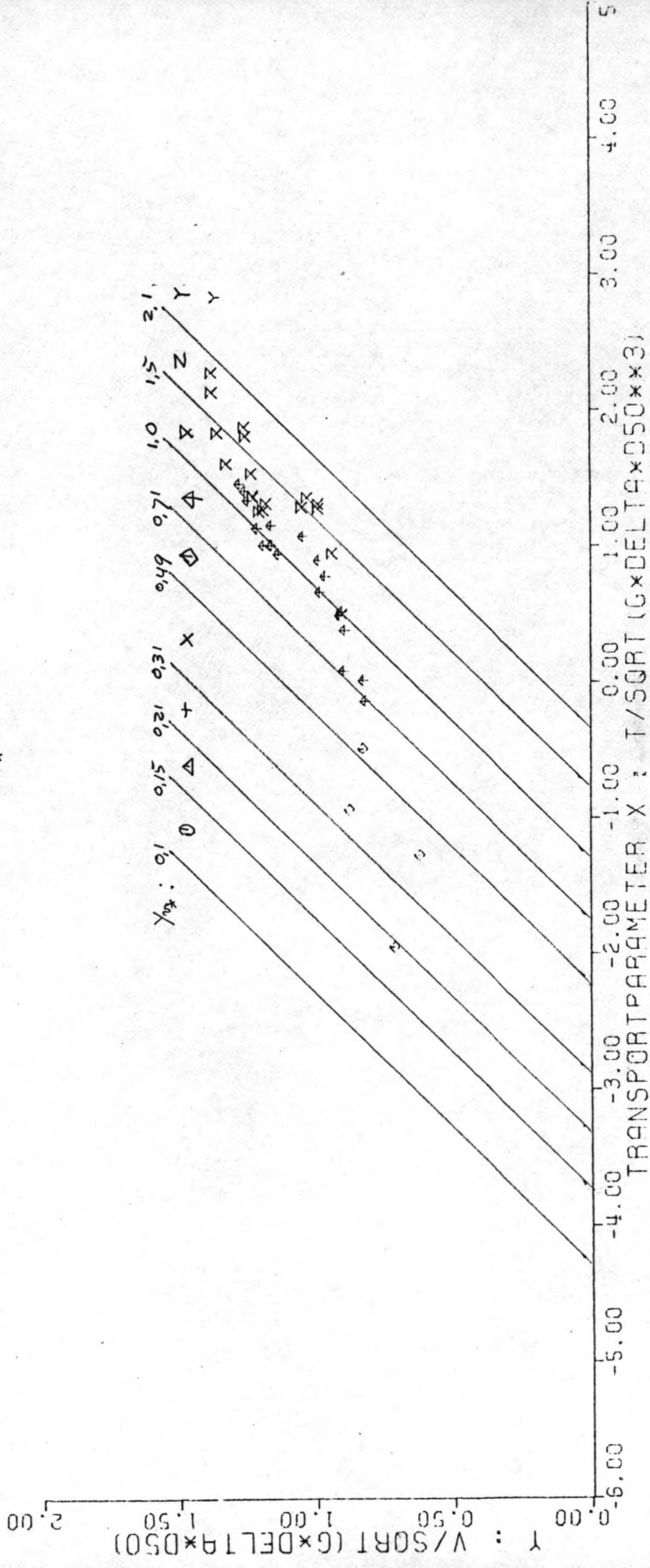


FIG 5.29

INTERVAL 15 : $\frac{b}{D_{90}} > 1000$

E.H. : $X = 0,05 Y_{1/4}^2 Y_{3/4}^2 Y_{5/4}^2$

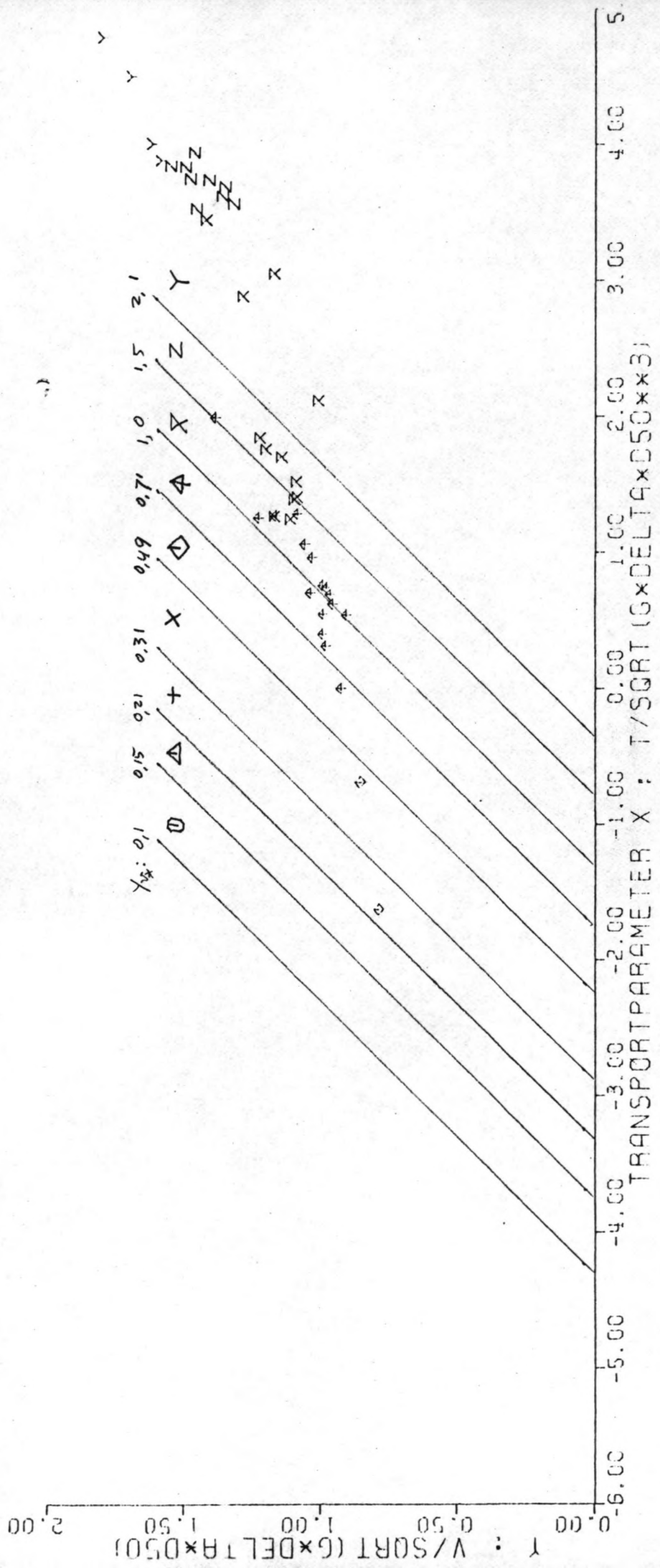


FIG. 5.30

Fig. 5.31 t/m 5.45 : Relatie tussen X , Y_{v^*} , Y_v en $\frac{R_b}{D_{90}}$ volgens Meyer Peter en Müller.

INTERVAL I : $\frac{R_s}{D_{90}} \leq 7.1$

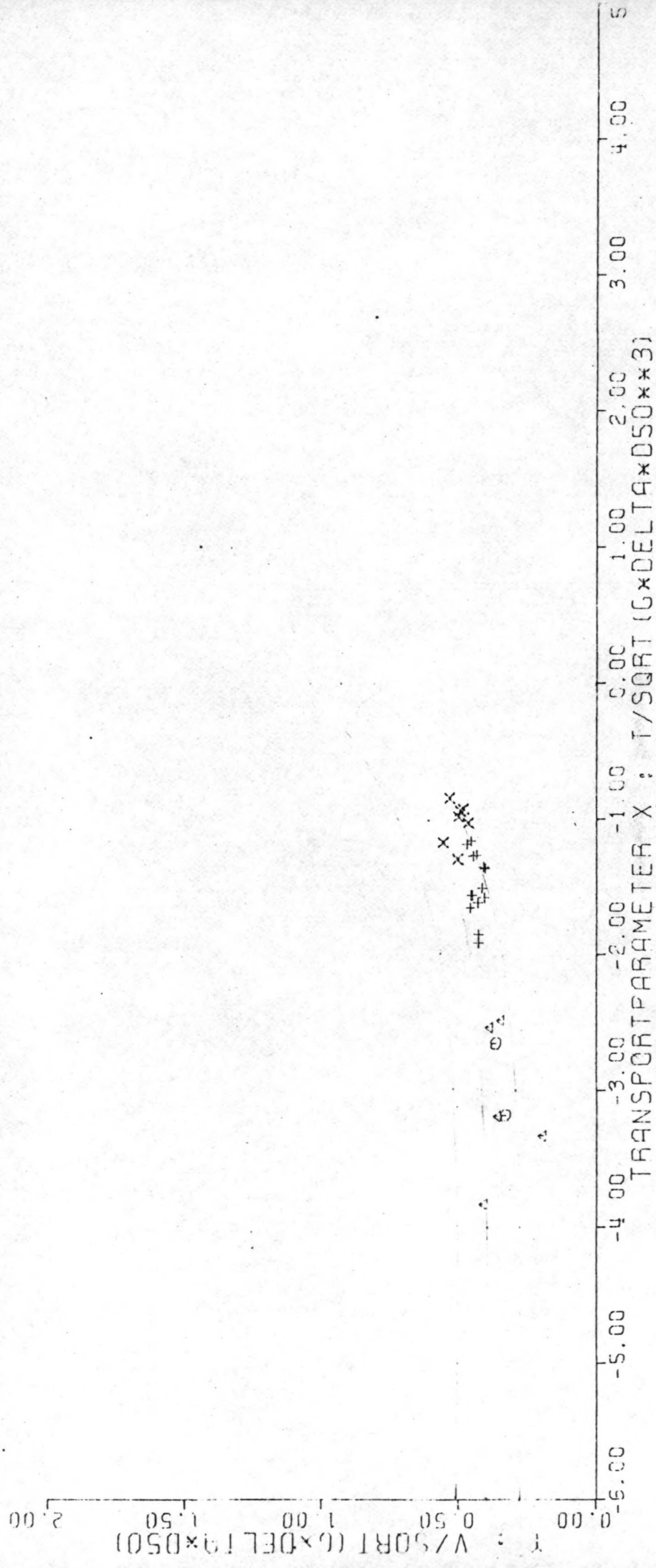


FIG. 5.31

INTERVAL 2 : $7.1 < \frac{R_B}{D_{p0}} \leq 10$

MP/M : $X = 8 \left\{ \left(\frac{\sqrt{g}}{c_i} \right)^2 Y_{cr} Y_{cr}^2 - 0.047 \right\}^2$

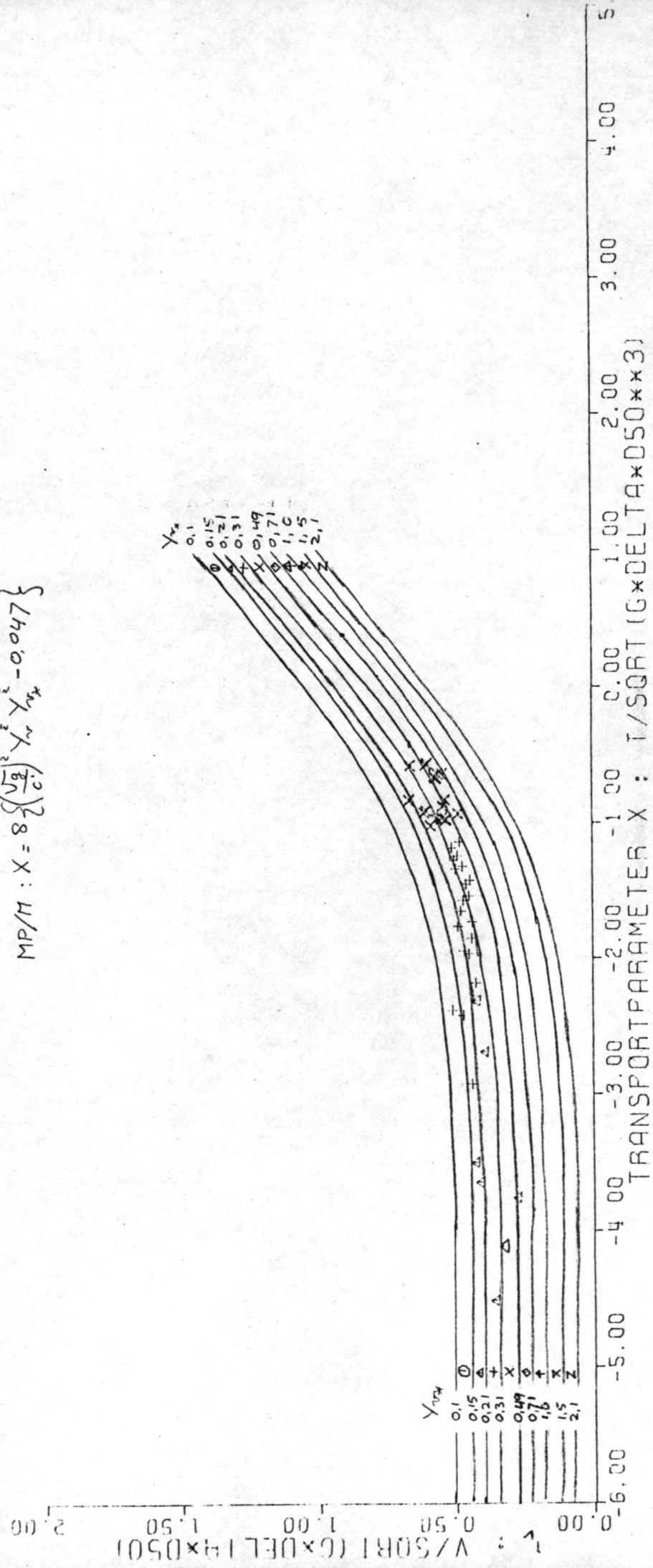


FIG 5.32

INTERVAL 3 : $10 < \frac{RB}{D_{70}} \leq 15$

$$MP/M : X = 8 \left\{ \left(\frac{\sqrt{2}}{2} \right)^2 Y_w^2 + Y_w - 0.047 \right\}^2$$

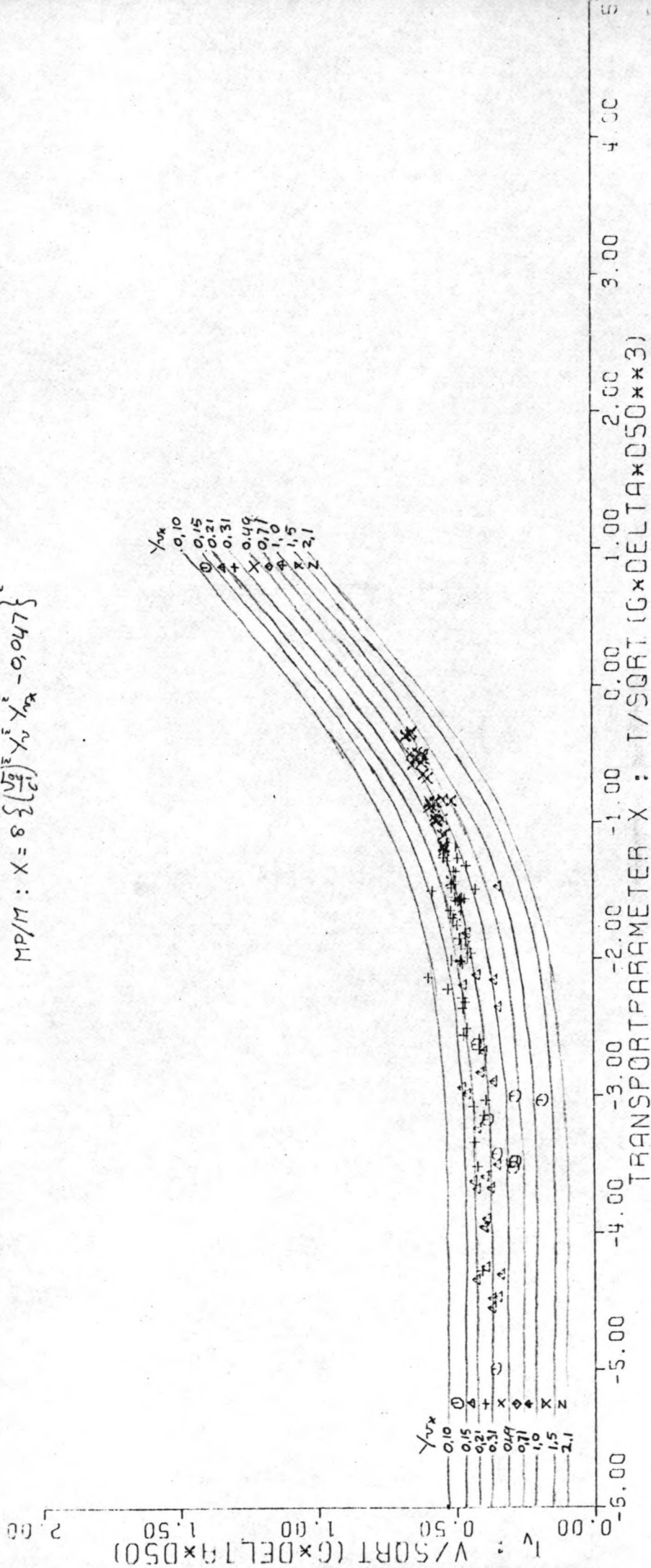


FIG. 5.33

INTERVAL 4 : $15 < \frac{R_B}{D_{90}} \leq 21$

$$MP/M : X = 8 \left\{ \left(\frac{U_g}{C_i} \right)^{\frac{3}{2}} \sqrt{Y_{rx}} - 0.047 \right\}^2$$

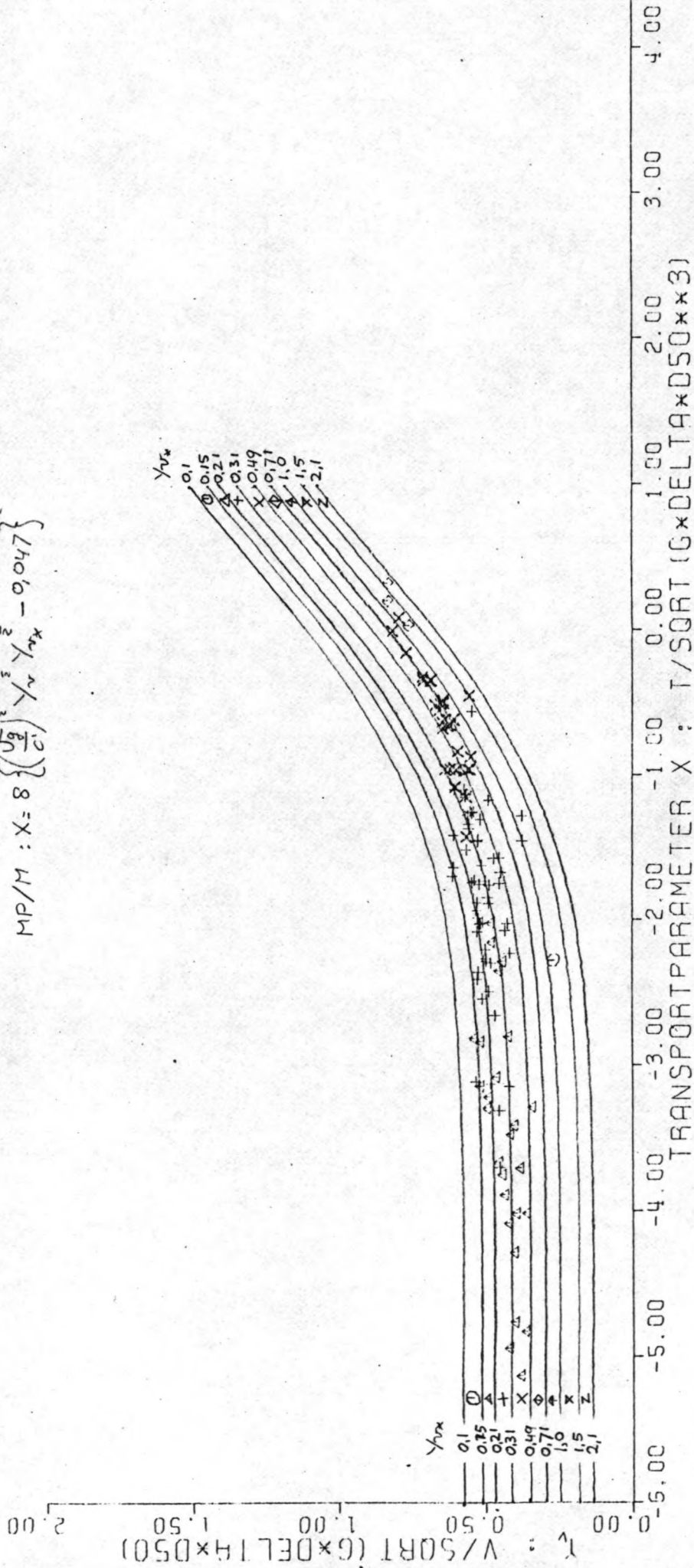


FIG. 5.34

INTERVAL 5 : $21 < \frac{R_B}{D_{90}} \leq 31$

$$MP/M : X = 8 \left\{ \left(\frac{\sqrt{Z}}{C} \right)^3 Y_w Y_{w*}^2 - 0.047 \right\}^3$$

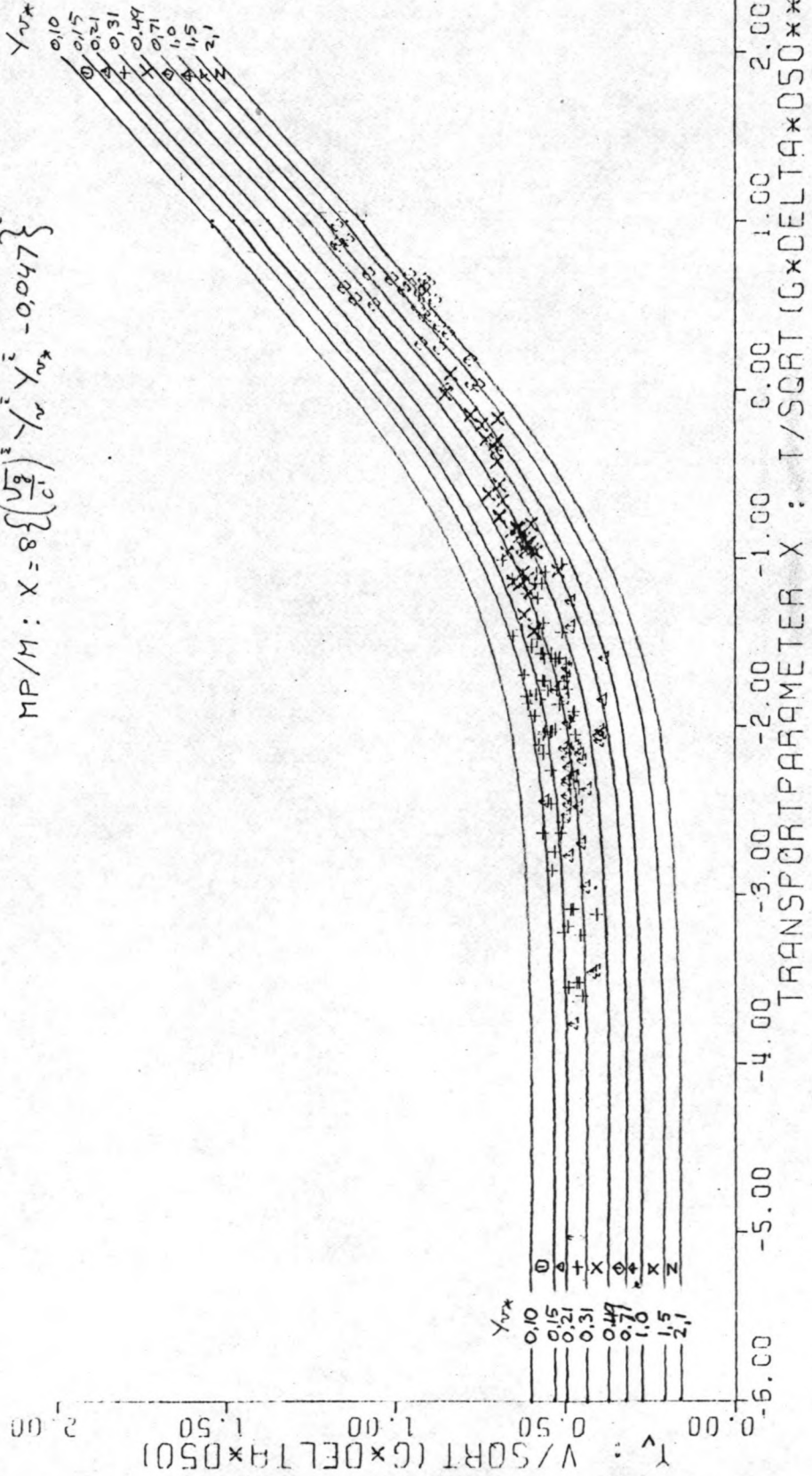


FIG. 5.35

INTERVAL 6 : $31 < \frac{R_B}{D_{90}} \leq 49$

$$MP/M : X = 8 \left\{ \left(\frac{\sqrt{2}}{c} \right)^3 Y_V^2 Y_{VT}^2 - 0.047 \right\}^2$$

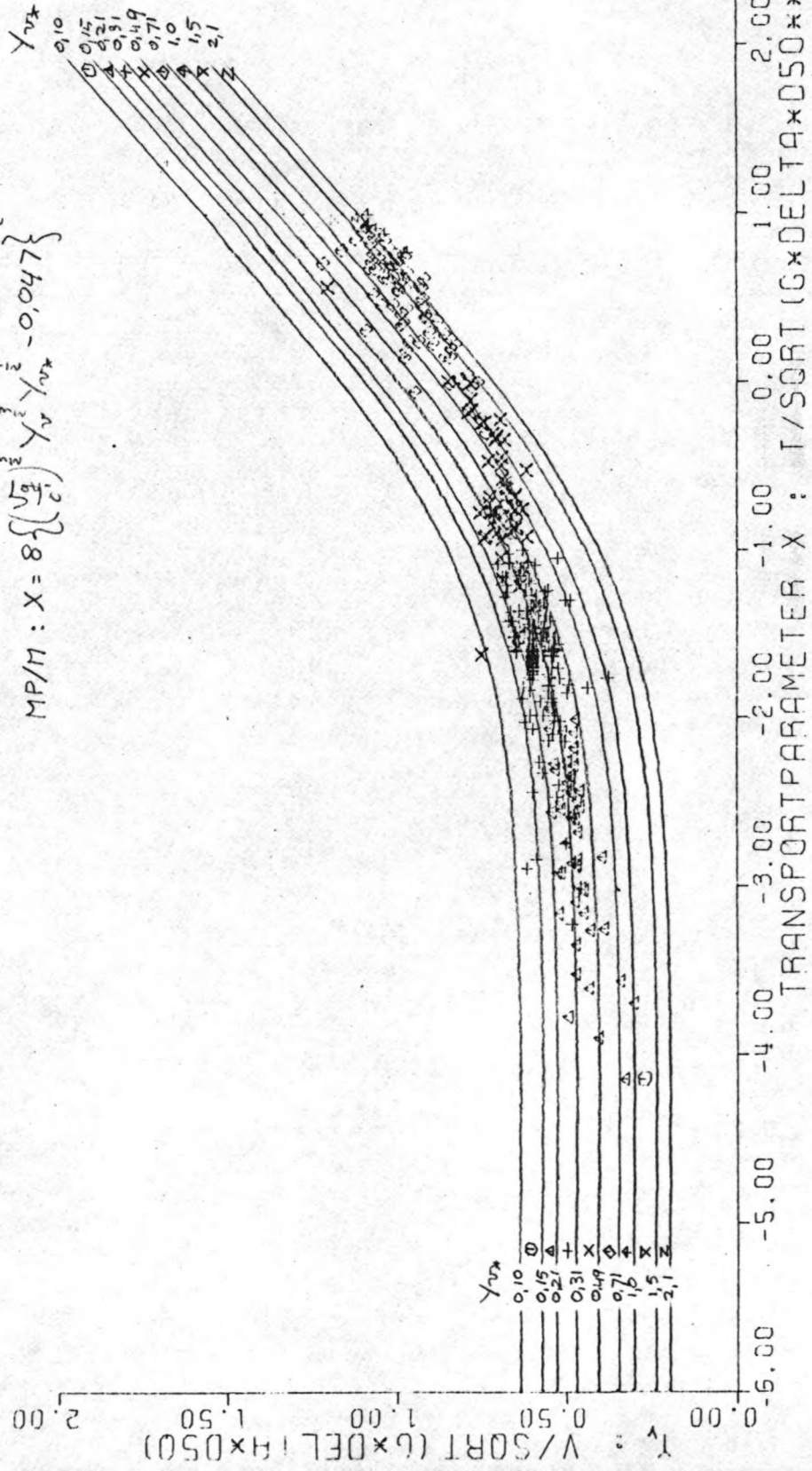


FIG. 5.36

INTERVAL 7 : $49 < \frac{R_B}{D_{90}} \leq 71$

$$MP/M : X = 8 \left\{ \left(\frac{\sqrt{2}}{C_i} \right)^{\frac{3}{2}} \sqrt{r} Y_{mx}^{\frac{1}{2}} - 0.047 \right\}^{\frac{3}{2}}$$

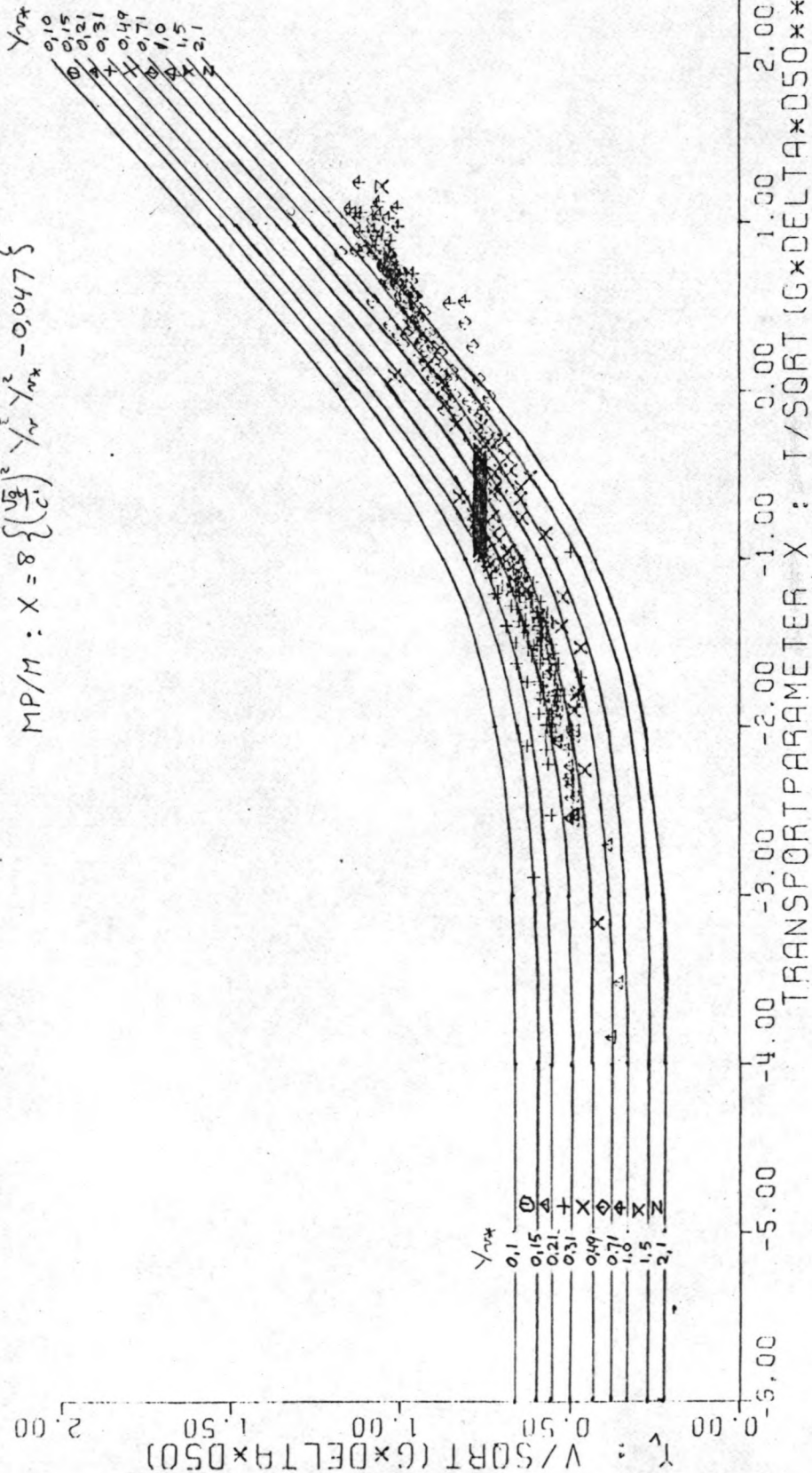


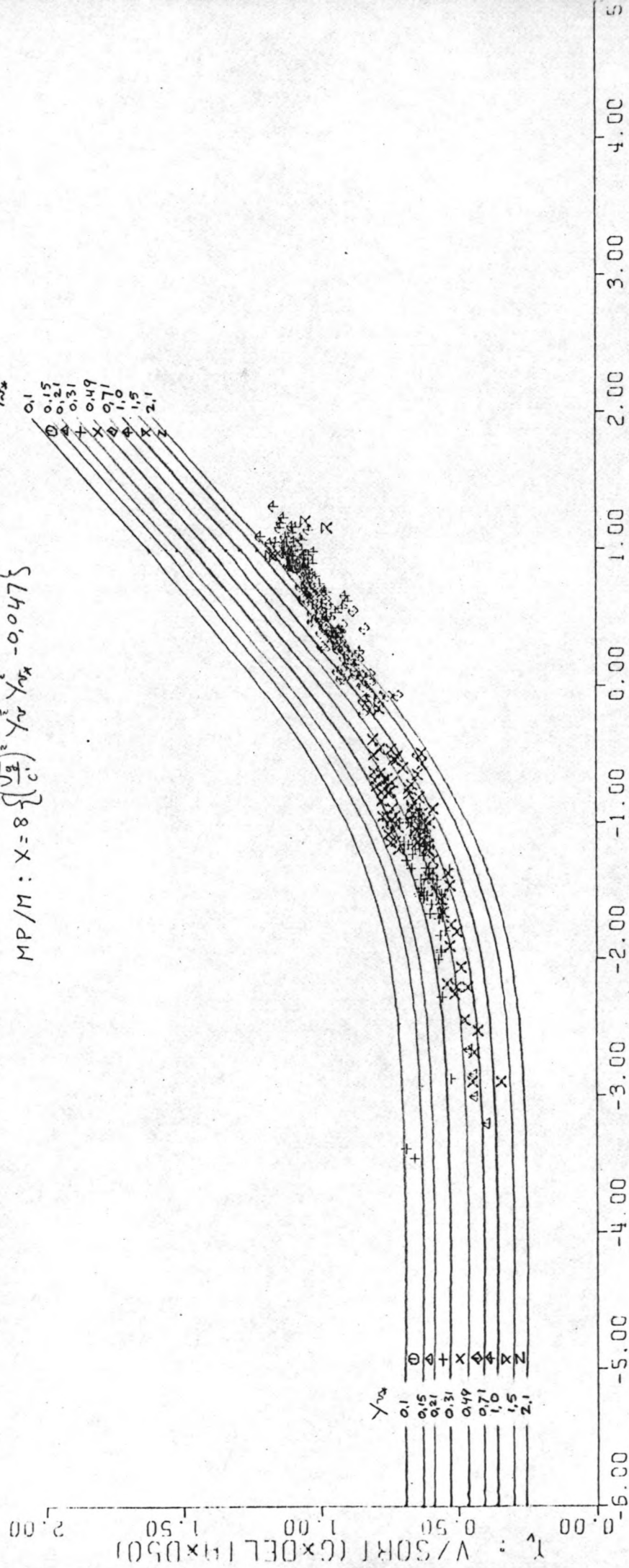
FIG 5.37

INTERVAL 8 : $71 < \frac{R_B}{D_{90}} \leq 100$

MP/M : $X = 8 \left\{ \left(\frac{V_{0.5}}{C} \right)^2 Y_{0.5} Y_{0.5} - 0.047 \right\}^2$

$Y_{0.5}$
0.1
0.15
0.21
0.31
0.49
0.71
1.0
1.5
2.1

$Y_{0.5}$
0.1
0.15
0.21
0.31
0.49
0.71
1.0
1.5
2.1



TRANSPORT PARAMETER X : $T/SORT (G \times DELTA \times 0.50 \times 3)$

FIG. 5.38

INTERVAL 9 / : $100 < \frac{R_B}{D_p} \leq 150$

$$MP/M : X = 8 \left\{ \left(\frac{V_0}{C_i} \right)^{\frac{3}{2}} Y_{rx} Y_{nx} - 0,047 \right\}$$

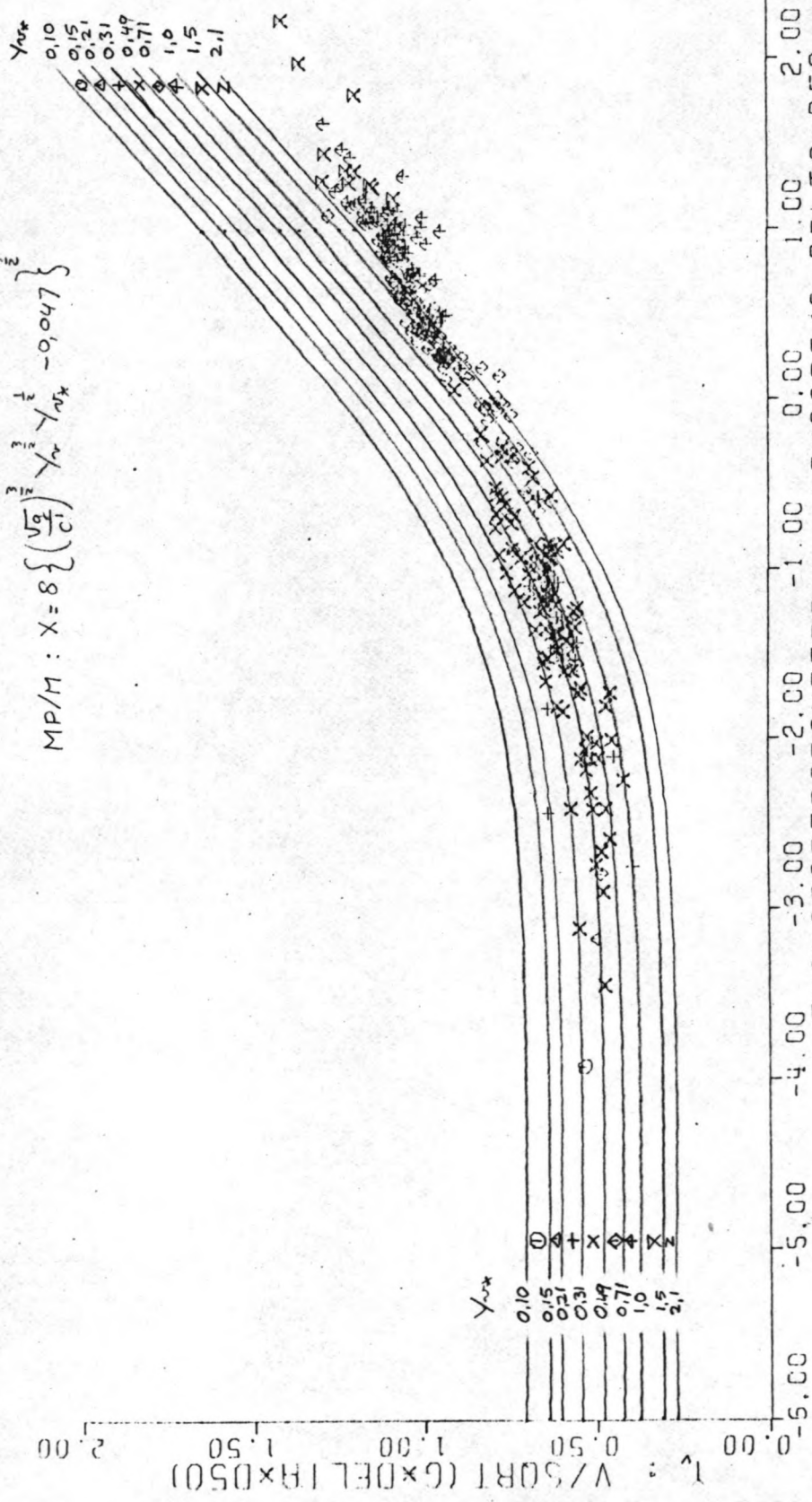


FIG. 5.39

INTERVAL 10 : $150 < \frac{R_{13}}{D_{p0}} \leq 210$

MP/M : $X = 8 \left\{ \left(\frac{V_{\text{eff}}}{C} \right)^{\frac{3}{2}} Y_{\text{eff}}^{\frac{1}{2}} - 0.047 \right\}^{\frac{2}{3}}$

Y_{eff}
 0.10
 0.15
 0.21
 0.31
 0.49
 0.71
 1.0
 1.5
 2.1

Y_{eff}
 0.10
 0.15
 0.21
 0.31
 0.49
 0.71
 1.0
 1.5
 2.1

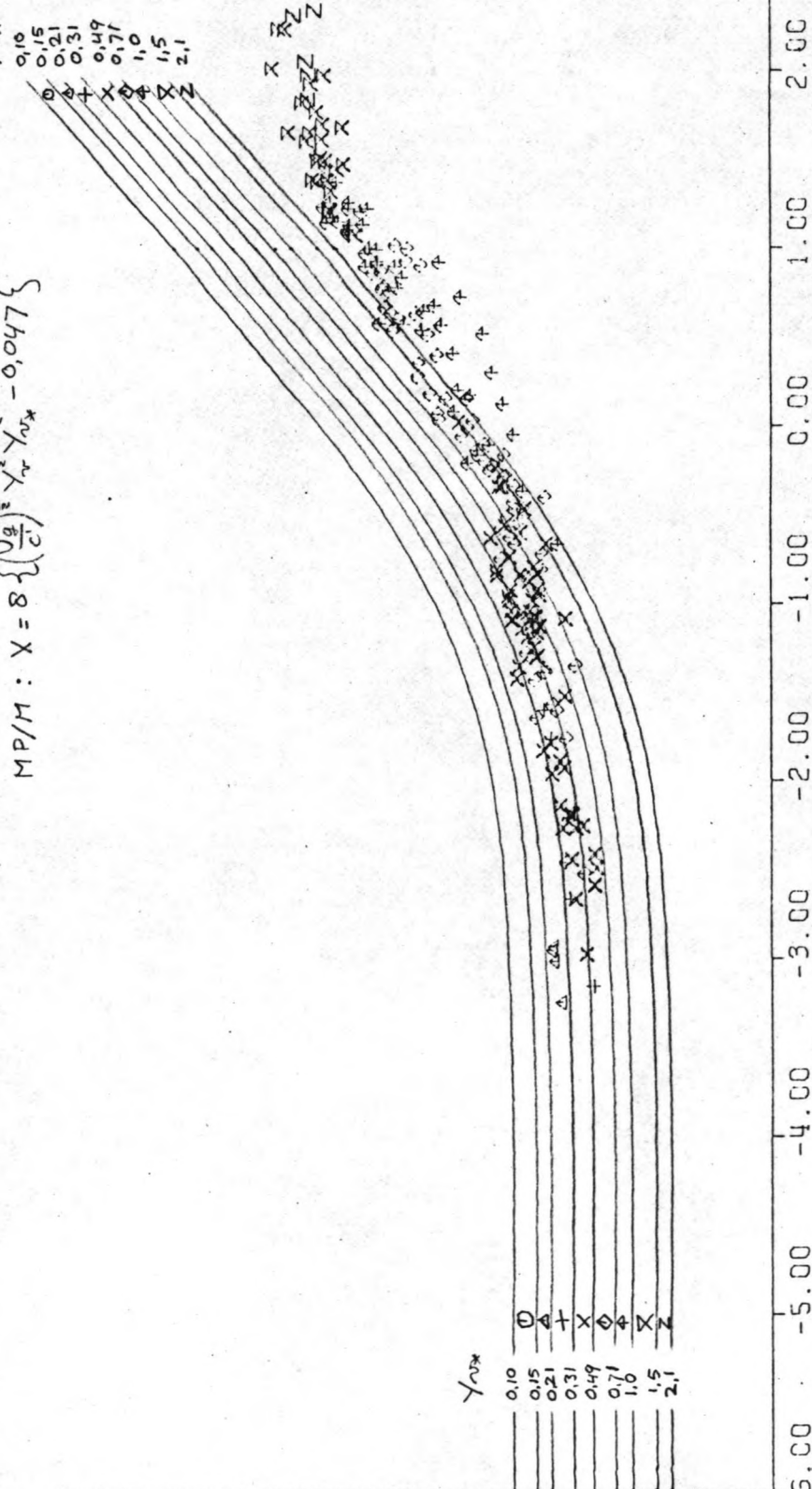
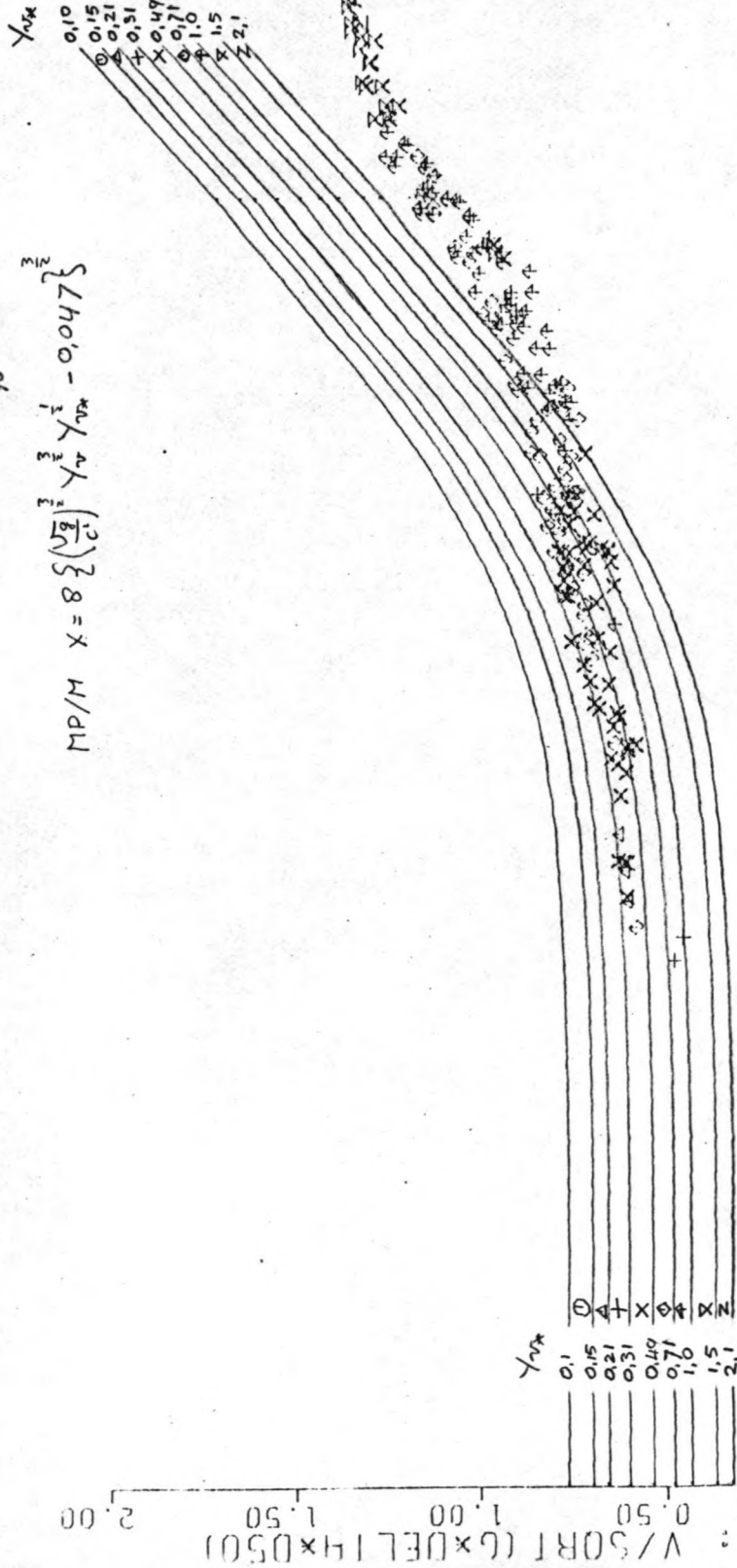


FIG. 5.40

INTERVAL II : $210 < \frac{R_B}{D_{90}} \leq 310$

$$MP/M \quad X = 8 \left\{ \left(\frac{\sqrt{Z}}{C} \right)^2 Y_v^2 Y_{vK}^2 - 0.047 \right\}^2$$



TRANSPORT PARAMETER X : $T/\text{SQRT}(G \times \text{DELTA} \times D50^{*3})$

FIG 6.41

INTERVAL 12 : $310 < \frac{R_B}{D_{70}} \leq 490$

$$MP/M \quad X=8 \quad \left\{ \left(\frac{\sqrt{g}}{c} \right)^2 Y_v^2 Y_{vx}^2 - 0.047 \right\}^2$$

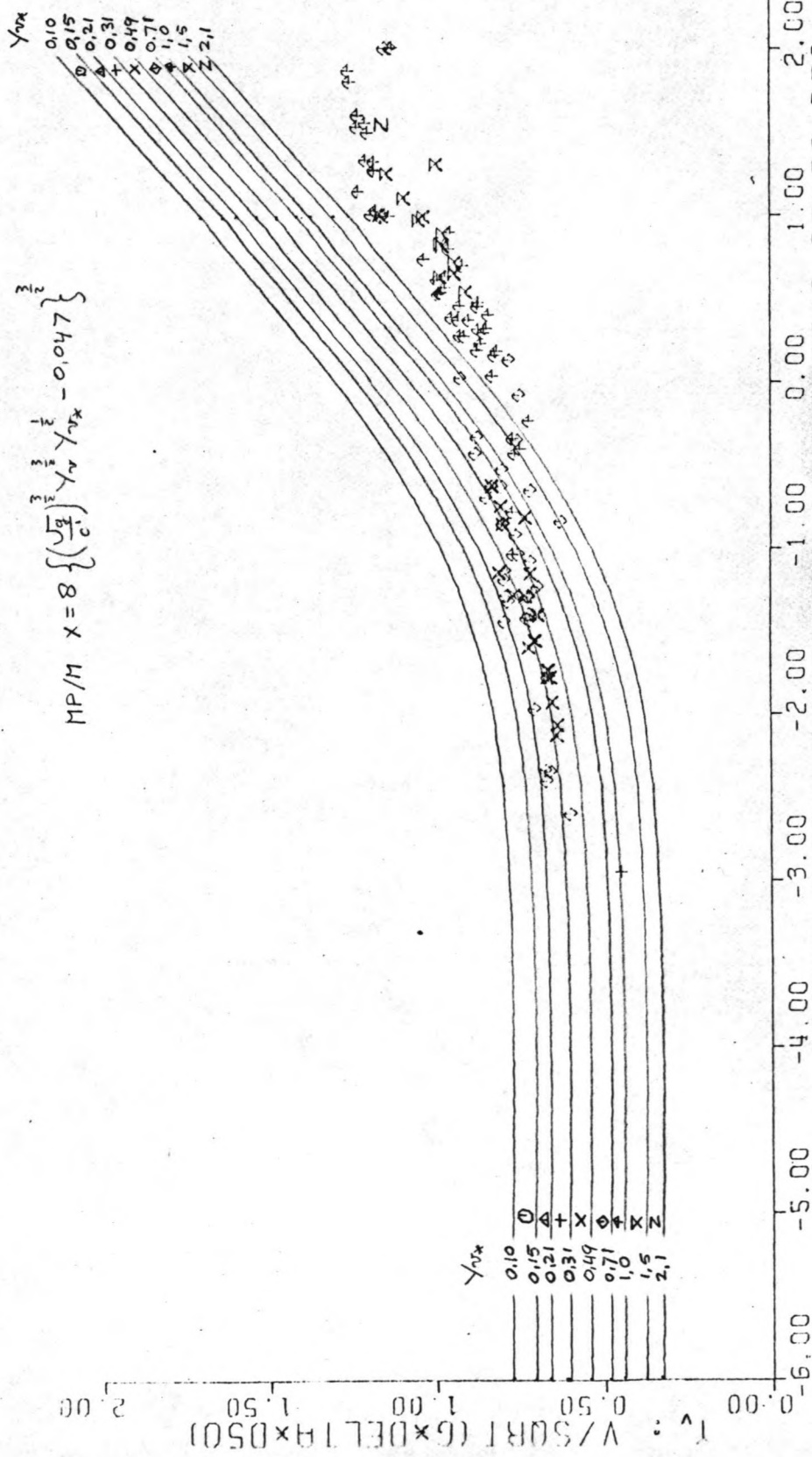


FIG. 5.42

INTERVAL 13 : $490 < \frac{R_B}{D_{90}} \leq 710$

$$MPM : X = 8 \left\{ \left(\frac{V_B}{C} \right)^{\frac{2}{3}} Y_w Y_{w*}^{\frac{1}{2}} - 0.047 \right\}^{\frac{3}{2}}$$

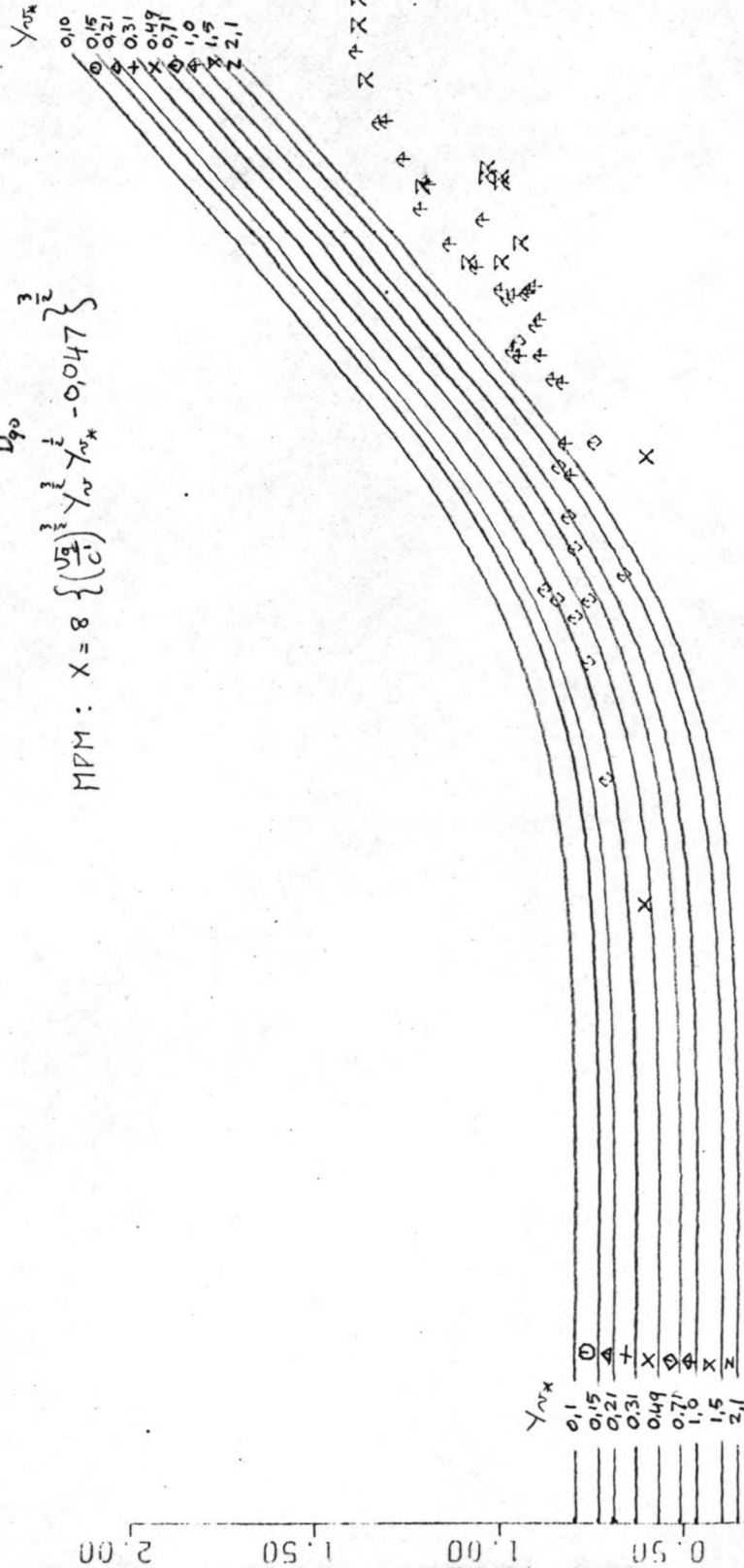


FIG. 5.43

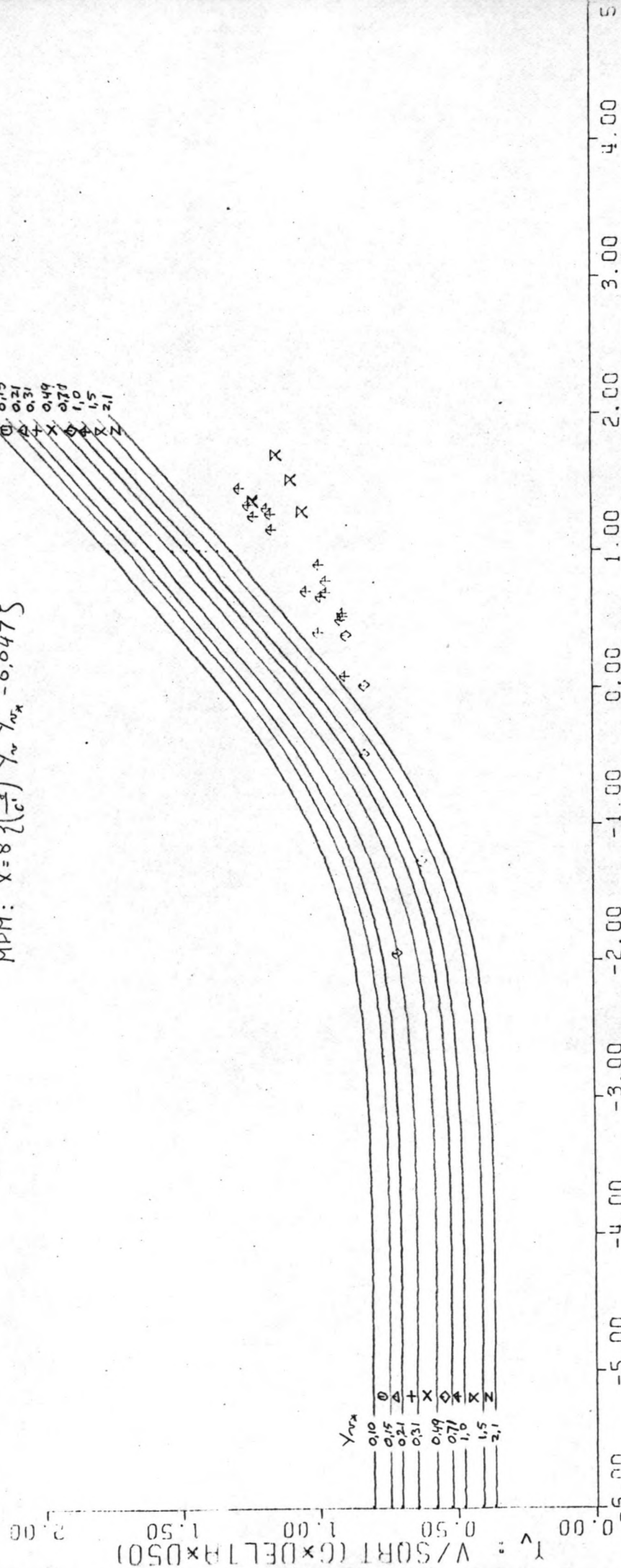
TRANSPORT PARAMETER X : $T/\text{SQRT}(G \times \text{DELTA} \times D_{50} \times \times 3)$

INTERVAL 14 : $710 < \frac{R_B}{D_{90}} \leq 1000$

$$\text{MPM: } X = 8 \left\{ \left(\frac{\sqrt{g}}{C} \right)^2 Y_w^2 Y_{wX}^2 - 0.047 \right\}^{\frac{1}{2}}$$

Y_{wX}
0.10
0.15
0.21
0.31
0.49
0.71
1.0
1.5
2.1

Y_{wX}
0.10
0.15
0.21
0.31
0.49
0.71
1.0
1.5
2.1



T : V/SQRT (G*DELTA*0.50)
-5.00 -4.00 -3.00 -2.00 -1.00 0.00 1.00 2.00 3.00 4.00 5.00

TRANSPORTPARAMETER X : T/SQRT (G*DELTA*0.50**3)

FIG. 5.44

INTERVAL 15 : $\frac{R_B}{D_{90}} > 1000$

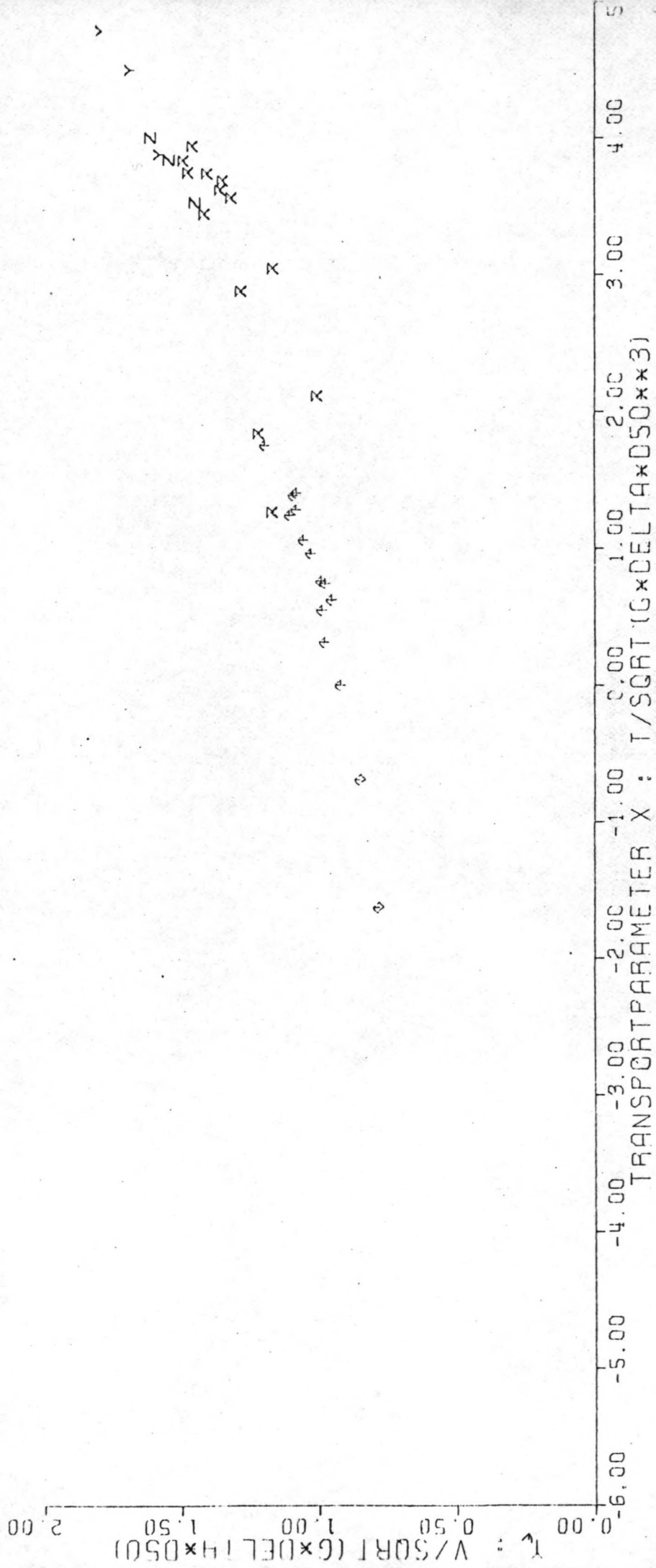


FIG. 5.45

Fig. 5.46 t/m 5.60 : Relatie tussen X , Y_{v^*} , Y_v en $\frac{R_b}{D}$ volgens
de 1^{ste} modificatie van M.P.M.⁹⁰

INTERVAL 1 : $\frac{R_B}{D_{90}} \leq 7.1$

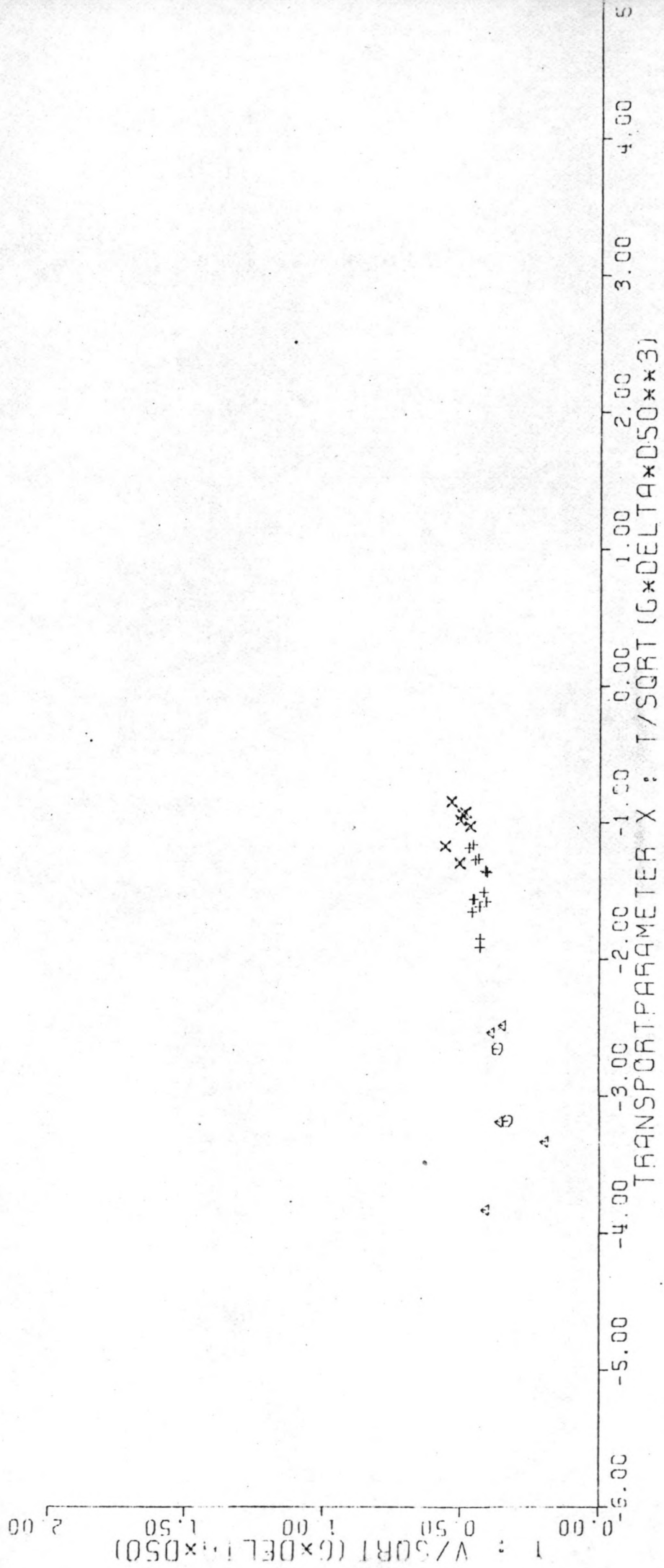


FIG. 5.46.

INTERVAL 2 : $7.1 < \frac{R_B}{D_{90}} \leq 10$

$$X = 44.4 \left\{ \left(\frac{V_{0.2}^2}{C_i} \right)^2 Y_{0.2}^2 Y_{0.2}^2 - 0.03 \right\}^2$$

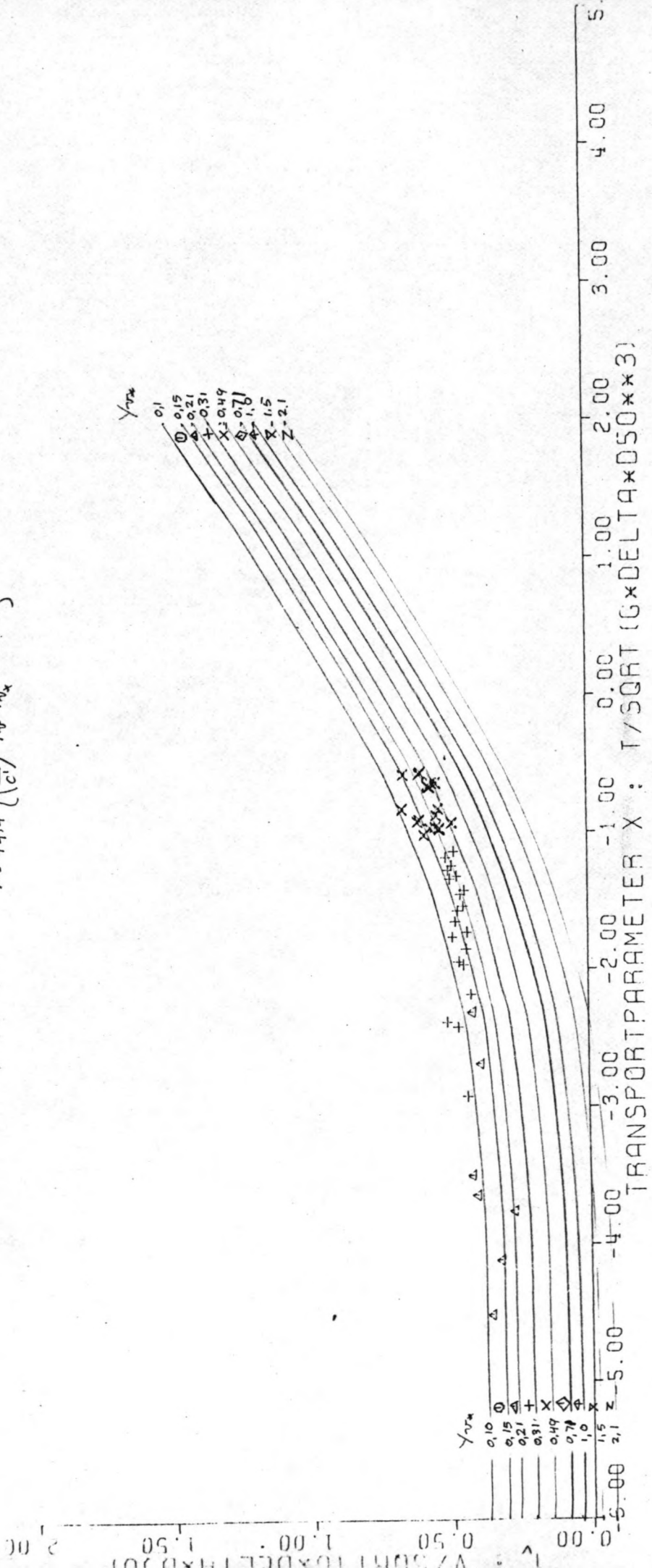


FIG. 5.47

INTERVAL 3 : $10 < \frac{R_B}{D_{90}} \leq 15$

$$X = 44.4 \left\{ \left(\frac{V_B}{C_i} \right)^3 Y_w^3 Y_{0*}^{\frac{1}{2}} - 0.03 \right\}^2$$

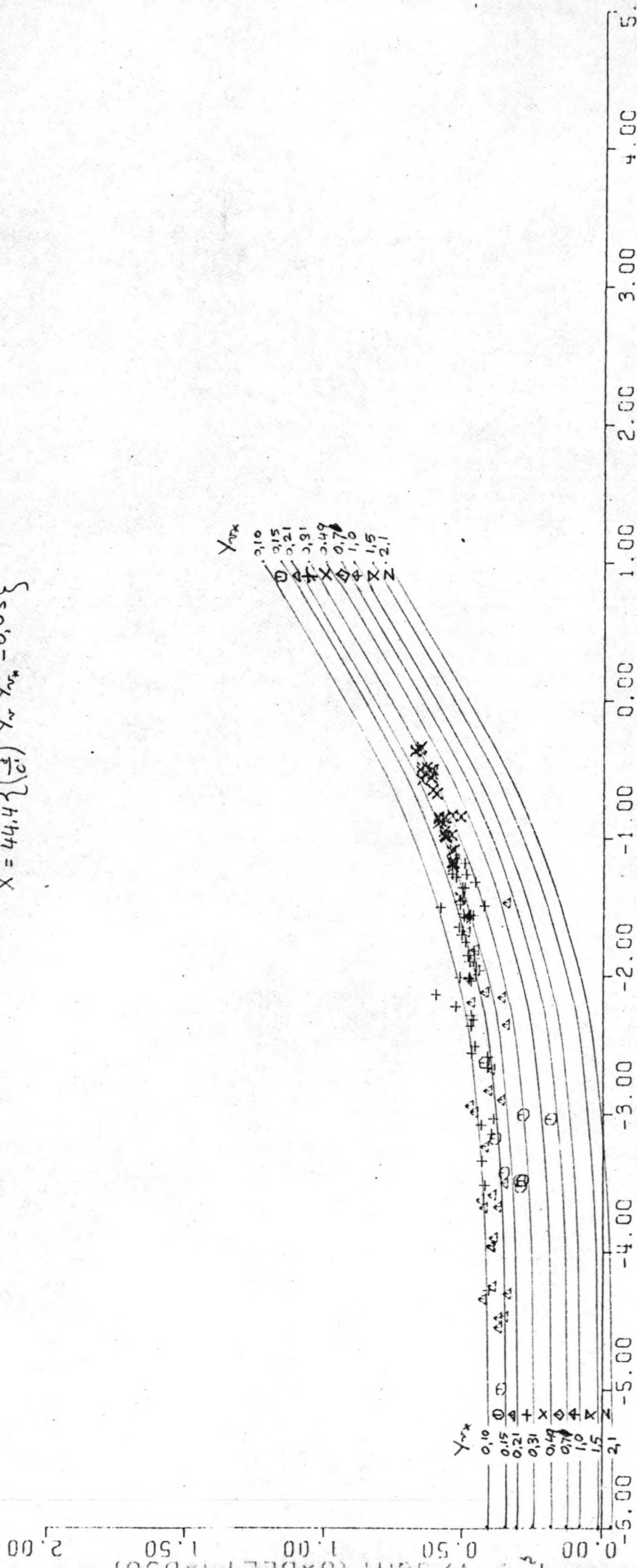


FIG. 5.48

INTERVAL 4 : $15 < \frac{R_B}{D_{p0}} \leq 21$

$$X = 44.4 \left\{ \left(\frac{\sqrt{g}}{c} \right)^2 Y_w^2 Y_w^2 - 0.03 \right\}^2$$

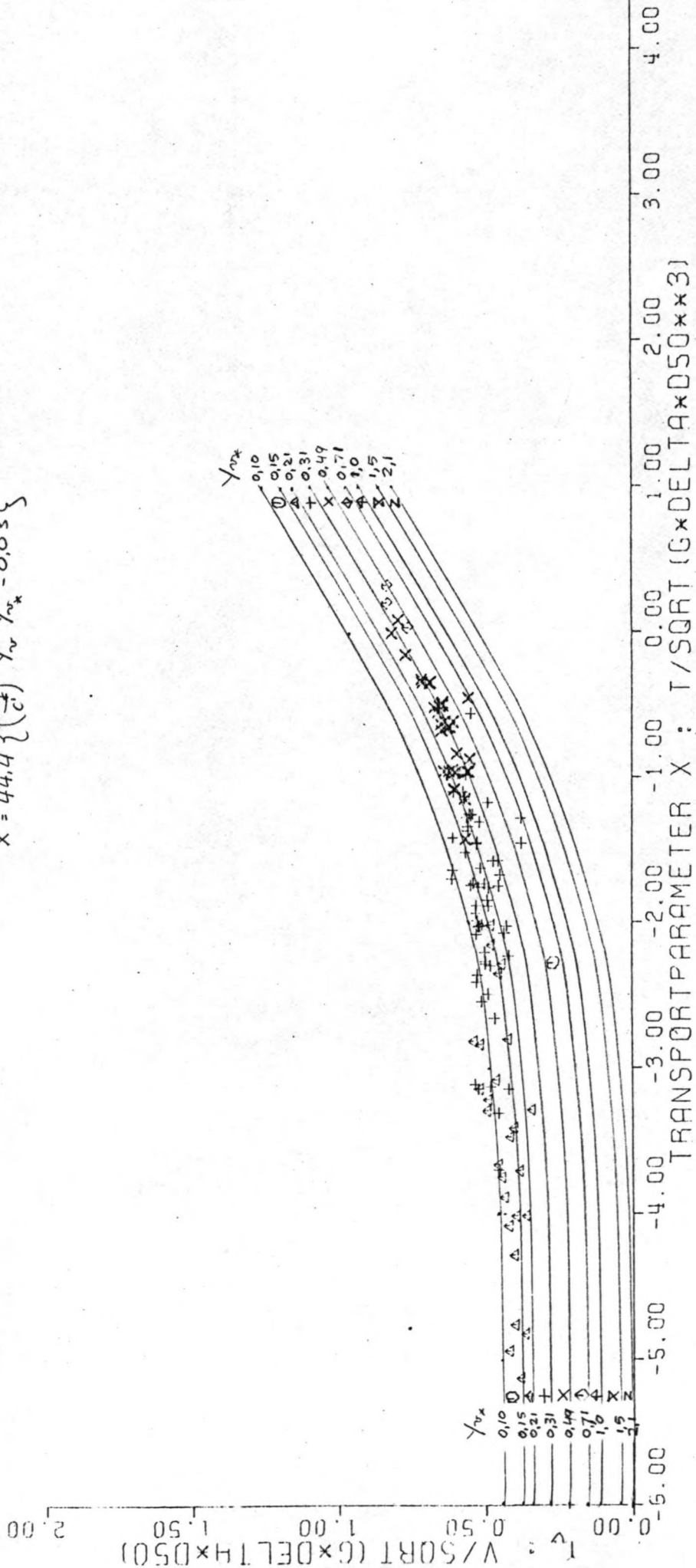


FIG. 5-49

INTERVAL 5 : $2.1 < \frac{R_B}{D_{90}} \leq 31$

$$X = 44.4 \left\{ \left(\frac{\sqrt{g}}{c} \right)^{\frac{3}{2}} \sqrt{Y_{0.5}} - 0.03 \right\}^2$$

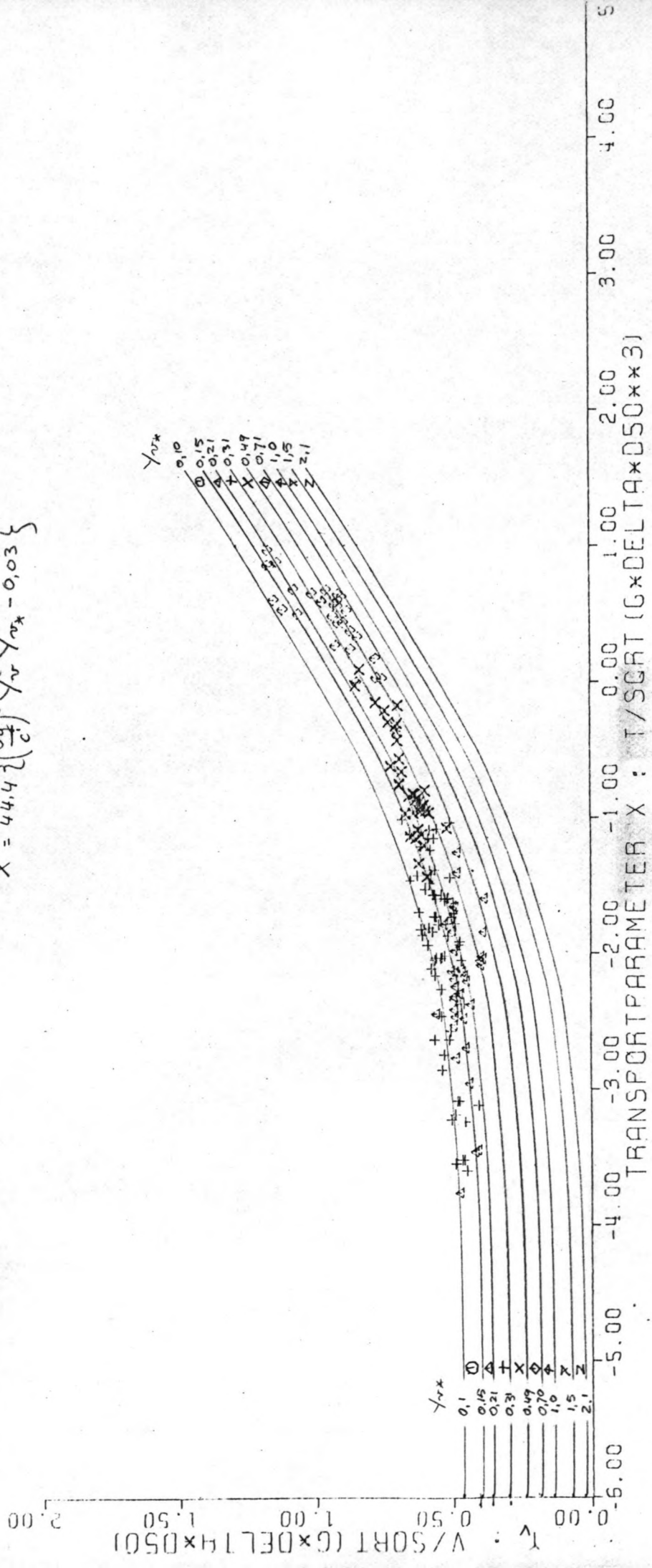


FIG 5.50

INTERVAL 6 : $31 < \frac{R^B}{D_{90}} \leq 49$

$$X = 44.4 \left\{ \left(\frac{V}{C} \right)^2 Y_w^2 Y_{n^*}^2 - 0.03 \right\}^2$$

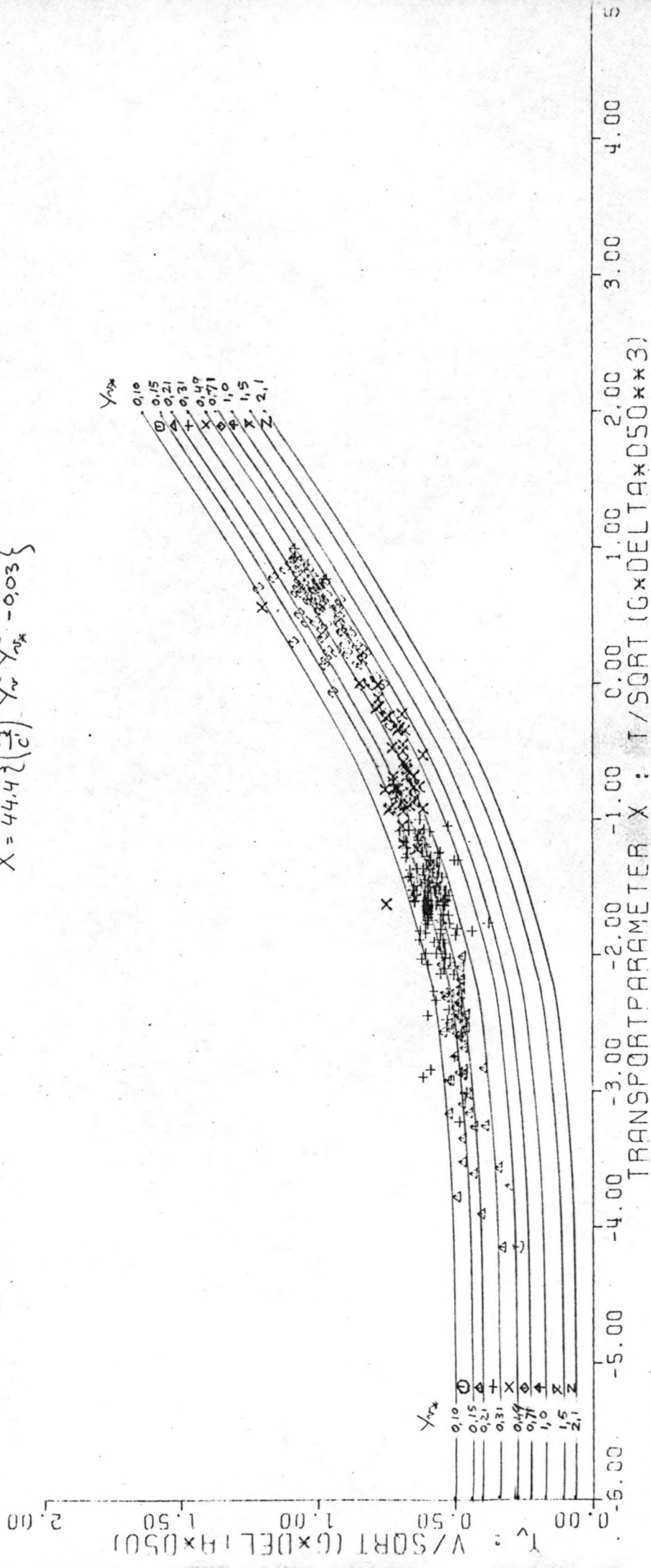


FIG. 5.51

INTERVAL 7 : $49 < \frac{R_B}{D_{90}} \leq 71$

$$X = 44.4 \left\{ \left(\frac{\sqrt{g}}{c} \right)^2 Y_v^2 Y_{n*}^2 - 0.03 \right\}^2$$

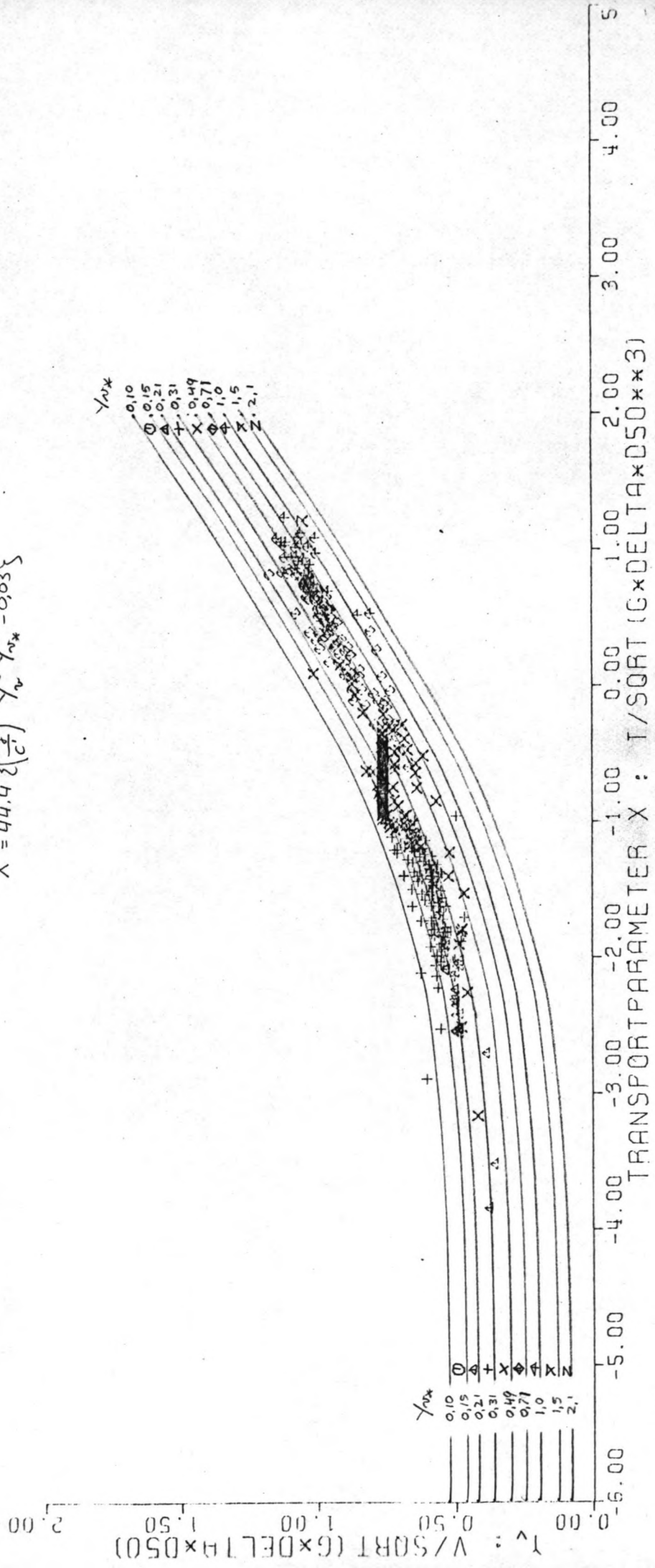


FIG. 6.52

INTERVAL 18 : $71 < \frac{RB}{D_{90}} \leq 100$

$$X = 44.4 \left\{ \left(\frac{\sqrt{g}}{c} \right)^2 Y_v Y_{vx} - 0.03 \right\}^2$$

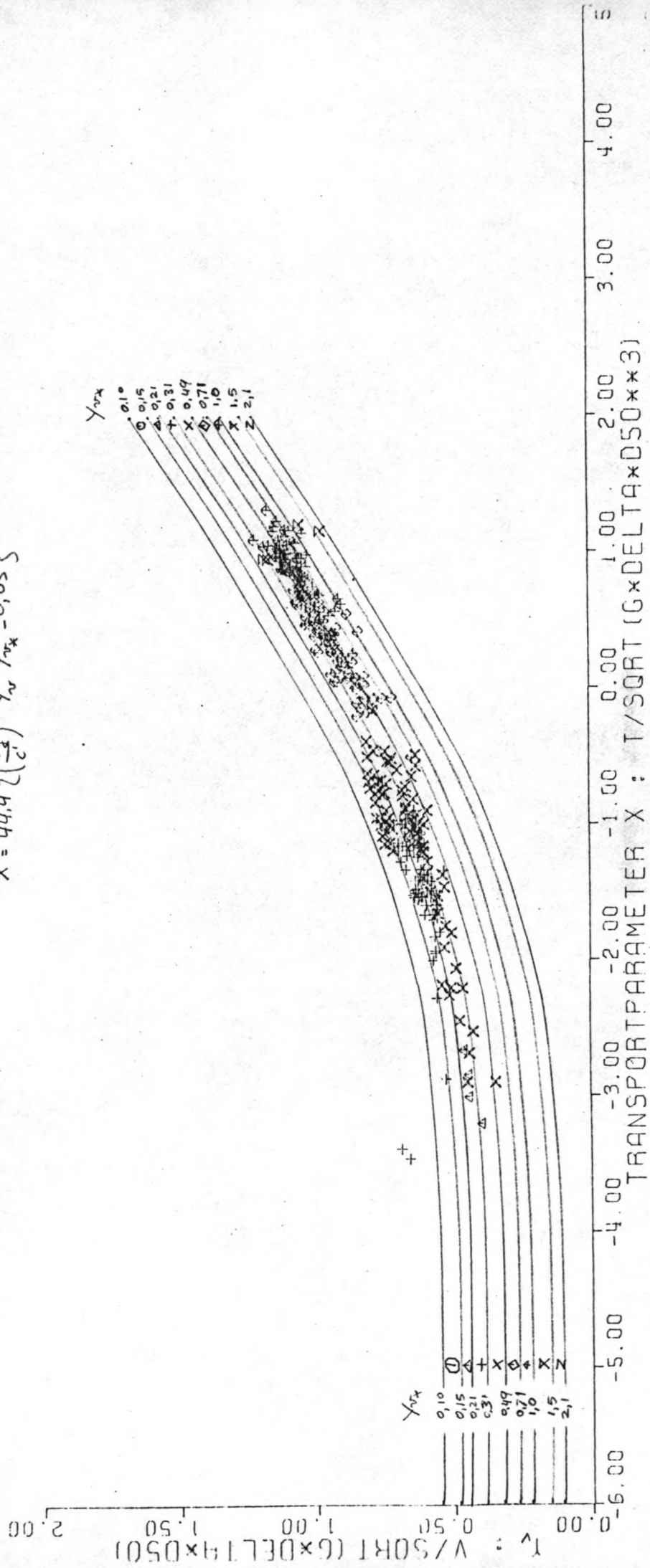


FIG. 5.53

INTERVAL 9 : $100 < \frac{R_B}{D_{90}} \leq 150$

$$X = 44.4 \left\{ \left(\frac{\sqrt{2}}{C} \right)^{\frac{3}{2}} Y_{\text{N}}^{\frac{1}{2}} Y_{\text{N}x}^{\frac{1}{2}} - 0.03 \right\}^2$$

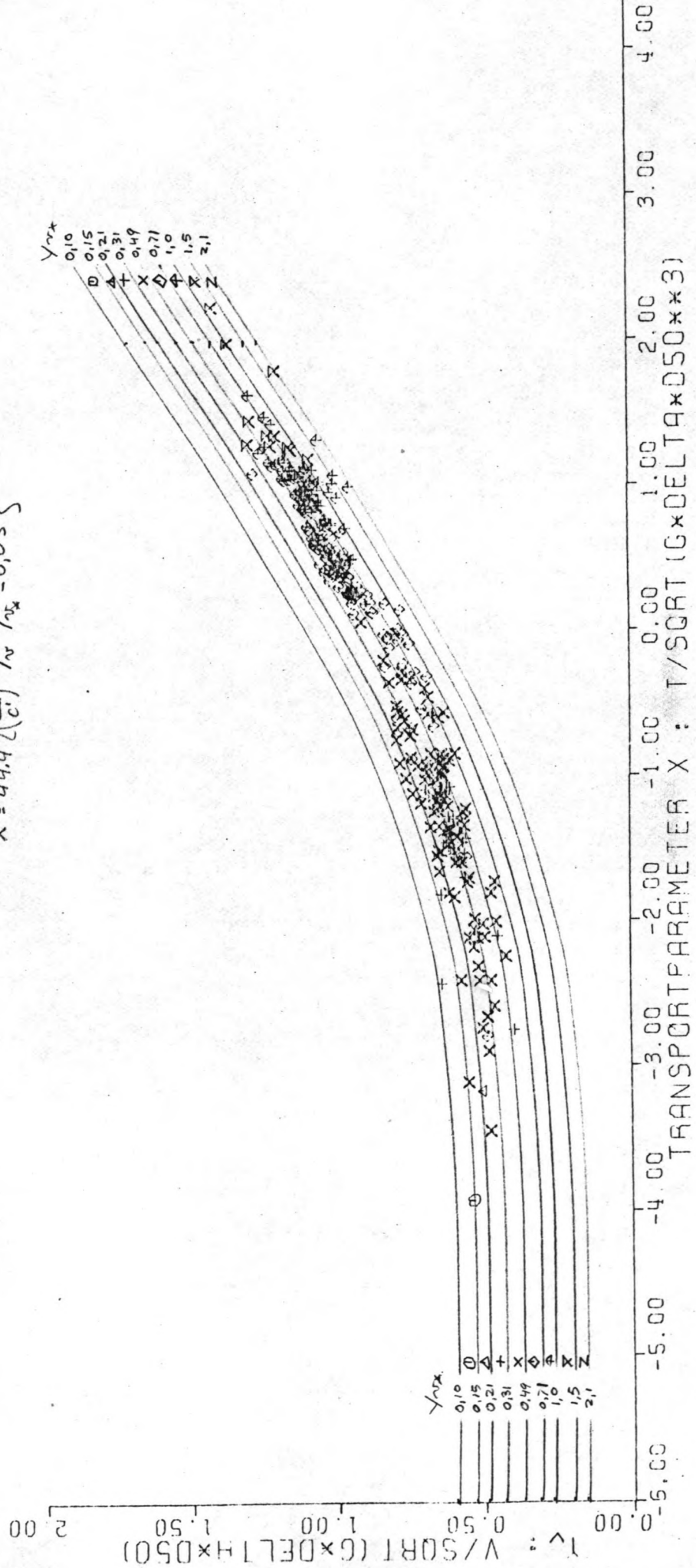
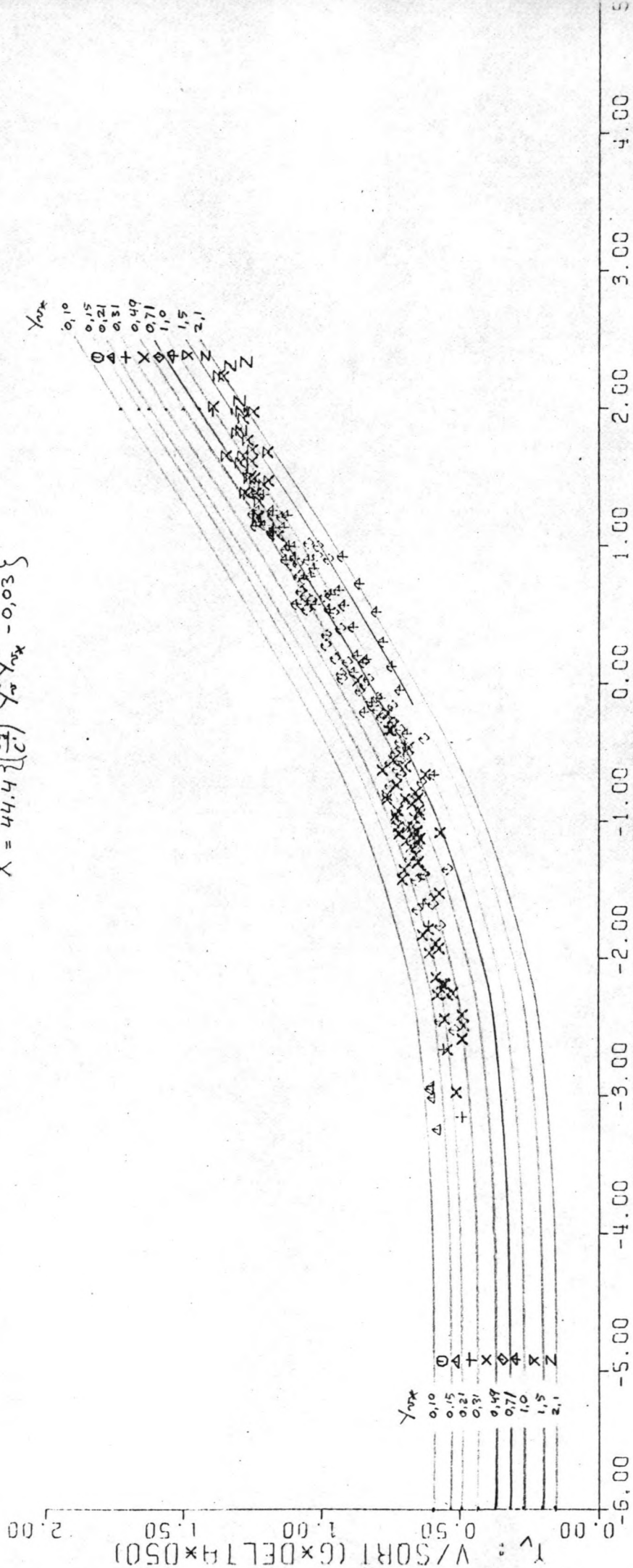


FIG. 5.54

INTERVAL 10 : $150 < \frac{R_B}{D_{90}} \leq 210$

$$X = 44.4 \left\{ \left(\frac{V_g}{C} \right)^2 Y_{ox}^2 - 0.03 \right\}^2$$

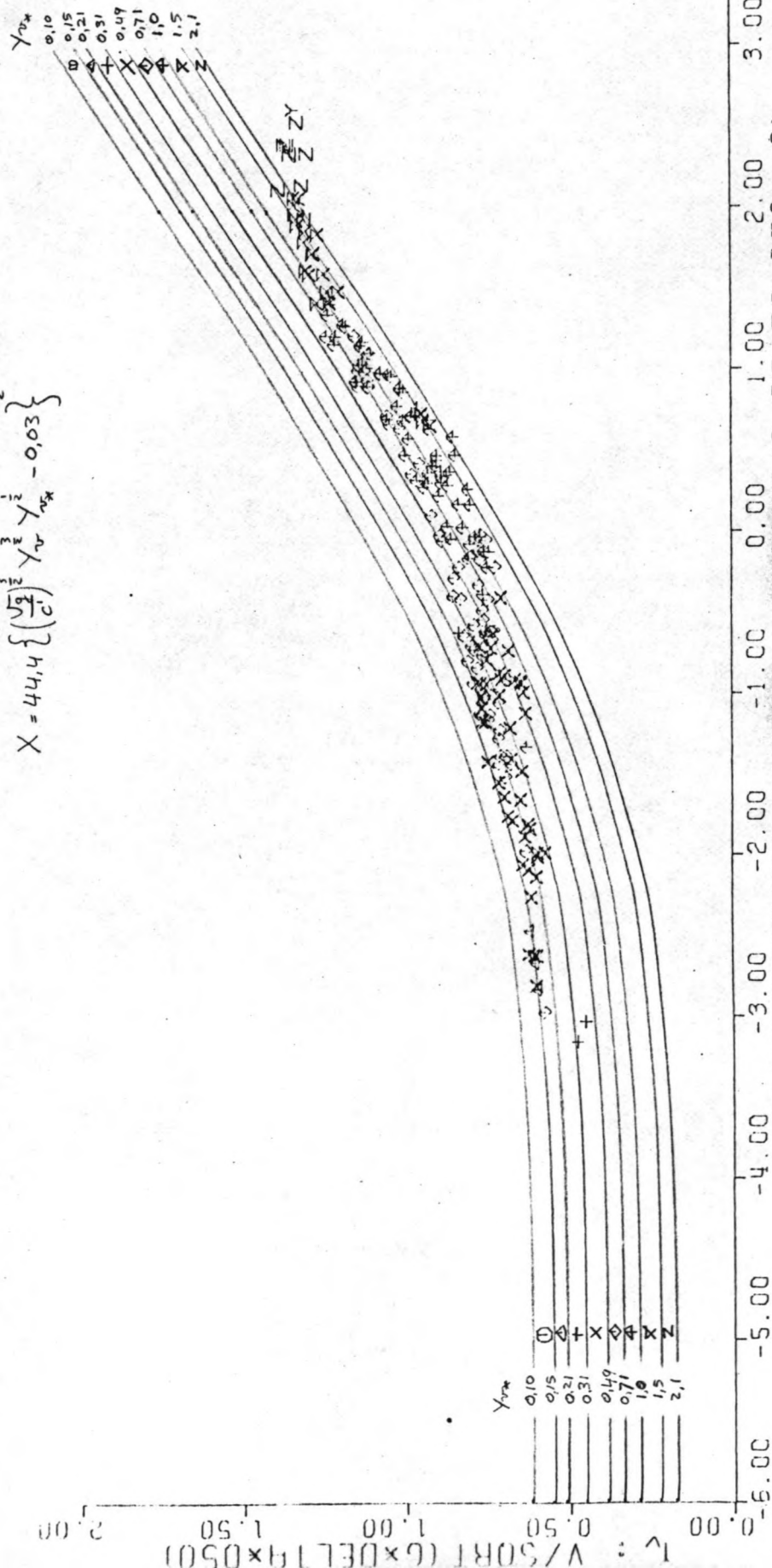


TRANSPORTPARAMETER X : $T/SORT(G*DELTA*0.50**3)$

FIG. 5.65

INTERVAL II : $210 < \frac{R_B}{D_{90}} \leq 310$

$$X = 44.44 \left\{ \left(\frac{\sqrt{g}}{c} \right)^2 Y_w^2 Y_{ox}^2 - 0.03 \right\}^2$$



TRANSPORT PARAMETER X : $T / \text{SQRT}(G * \text{DELTA} * 0.50 * X^3)$

FIG. 5.56

INTERVAL 12 : $310 < \frac{R^3}{D_{90}} \leq 490$

$$X = 44.4 \left\{ \left(\frac{V}{c_i} \right)^2 Y_w^3 Y_{w*}^2 - 0.03 \right\}$$

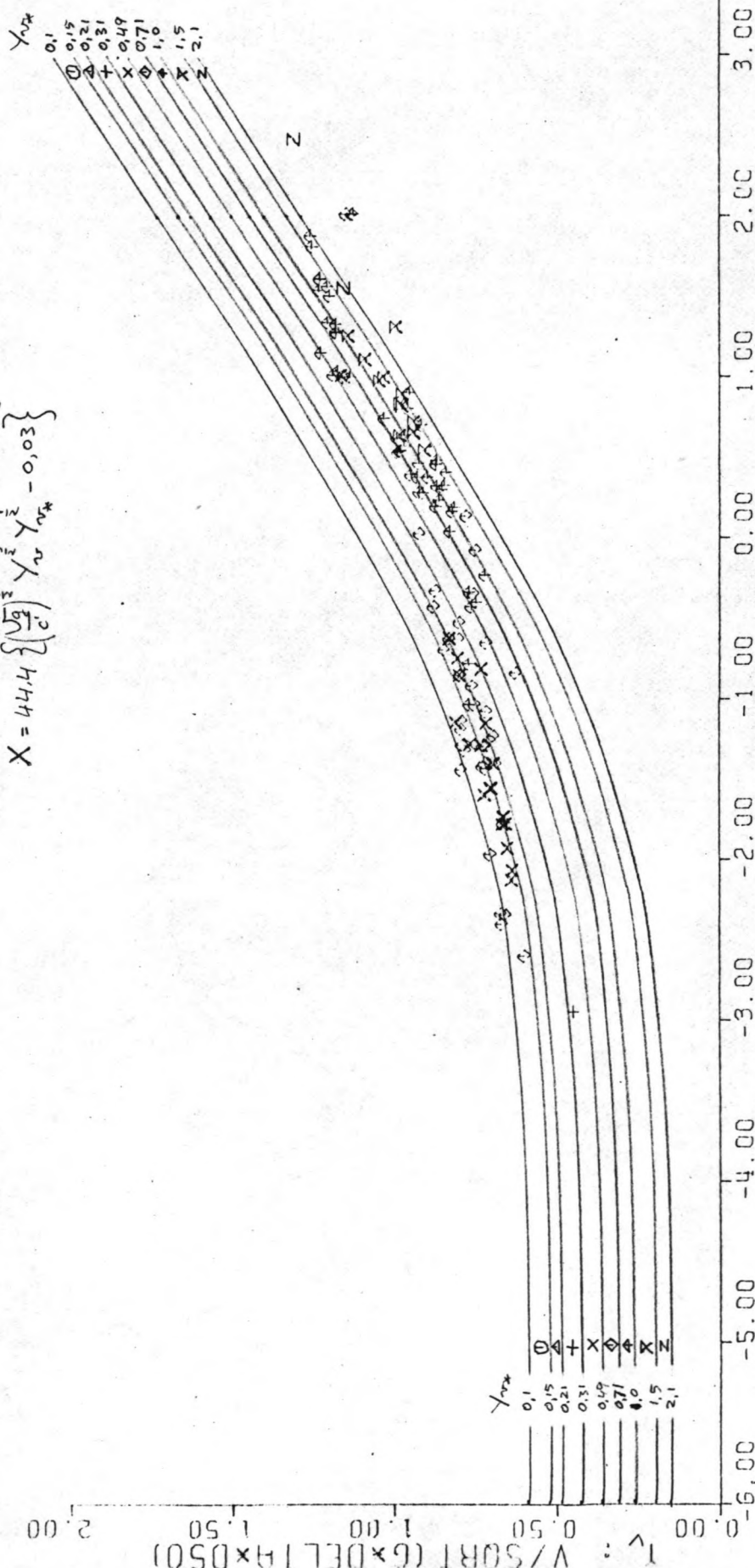


FIG. 5.57

INTERVAL 13 : $490 < \frac{R_B}{D_{90}} \leq 710$

$$X = 44.4 \left\{ \left(\frac{V_g}{C} \right)^2 Y_v^{\frac{2}{3}} Y_v^{\frac{1}{2}} Y_{va} - 0.03 \right\}^2$$

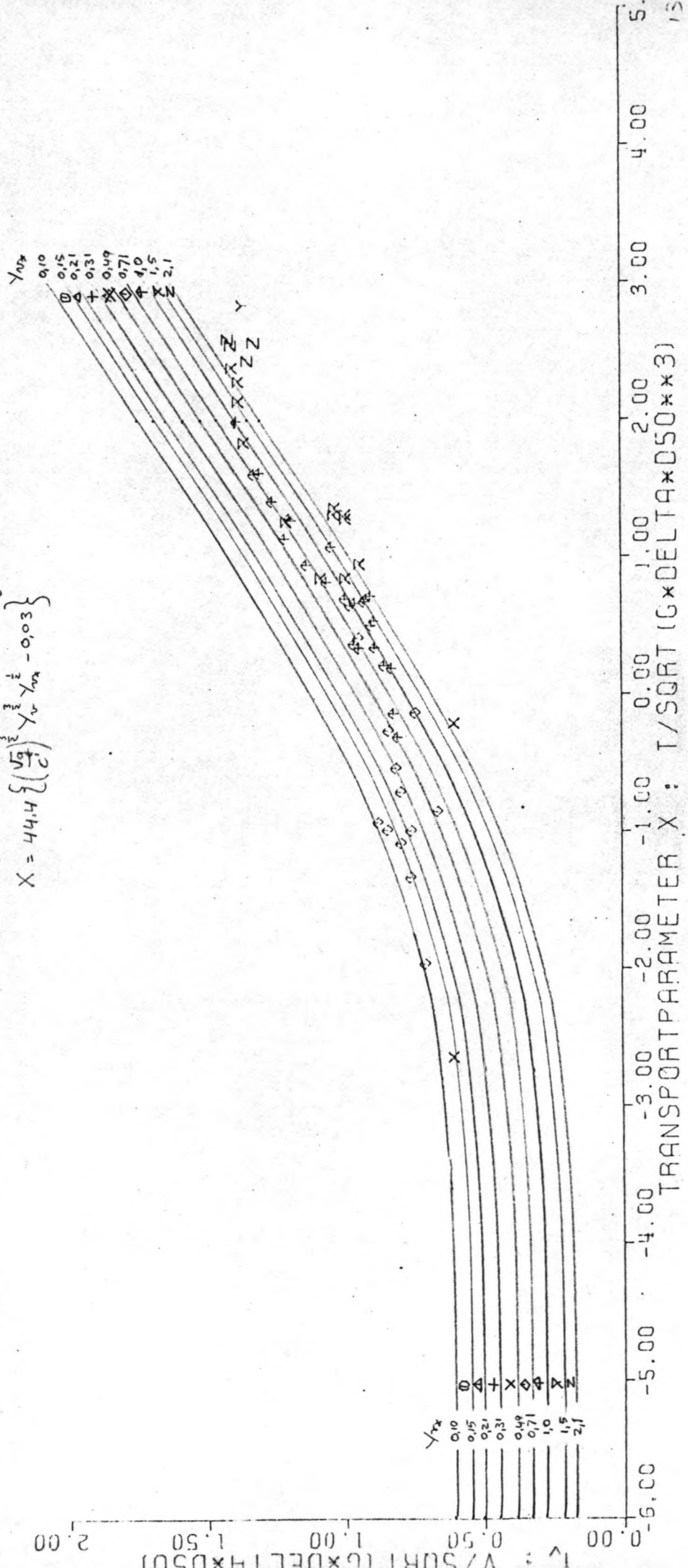


FIG. 5-58

INTERVAL 14 : $710 < \frac{R_B}{D_{90}} \leq 1000$

$$X = 44.4 \left\{ \left(\frac{V_{max}}{c} \right)^{\frac{2}{3}} Y_w^{\frac{1}{2}} Y_{max}^{\frac{1}{2}} - 0.03 \right\}^2$$

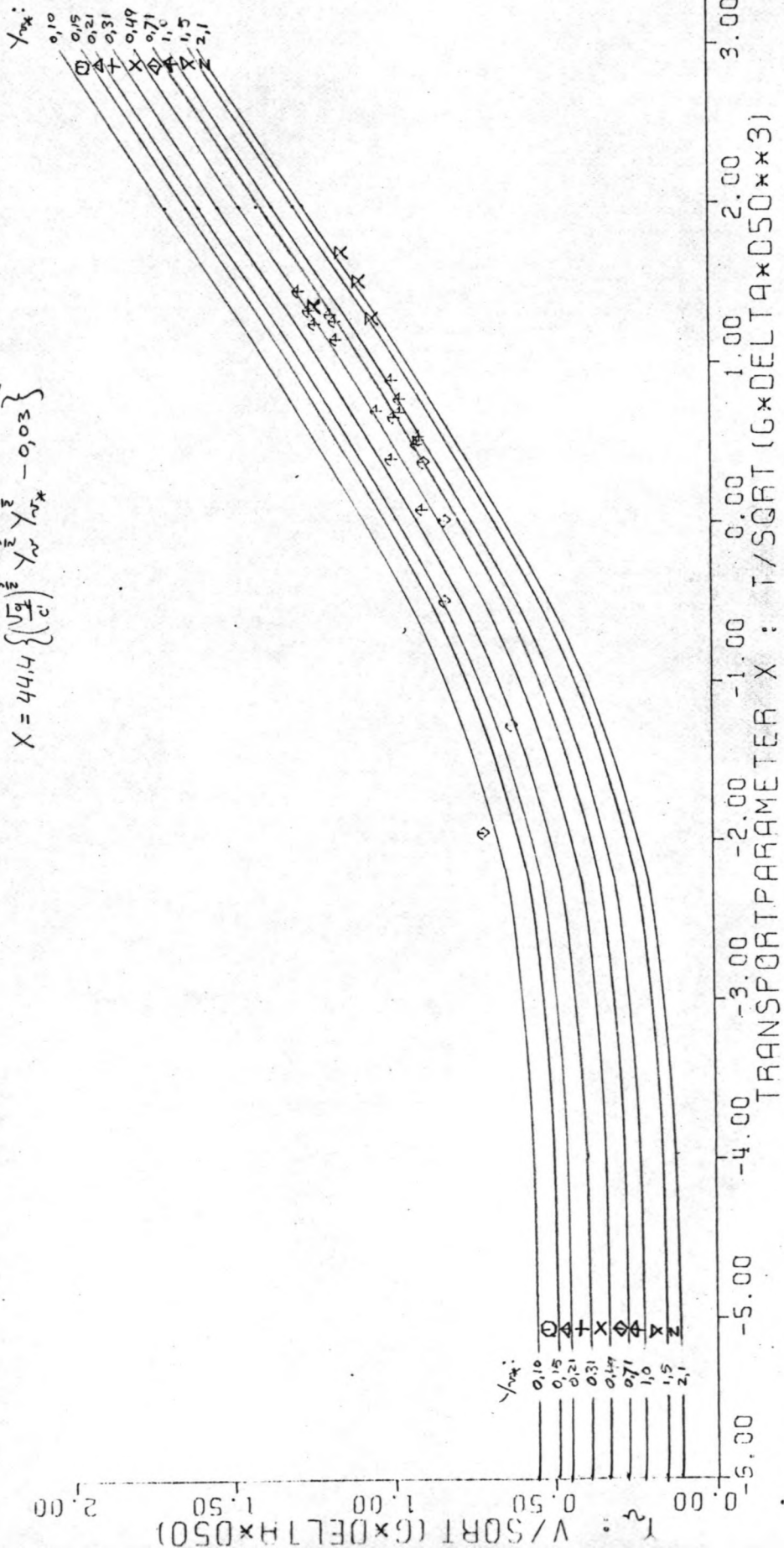


FIG. 5:59

INTERVAL 15 = : $\frac{R_B}{D_{90}} > 1000$

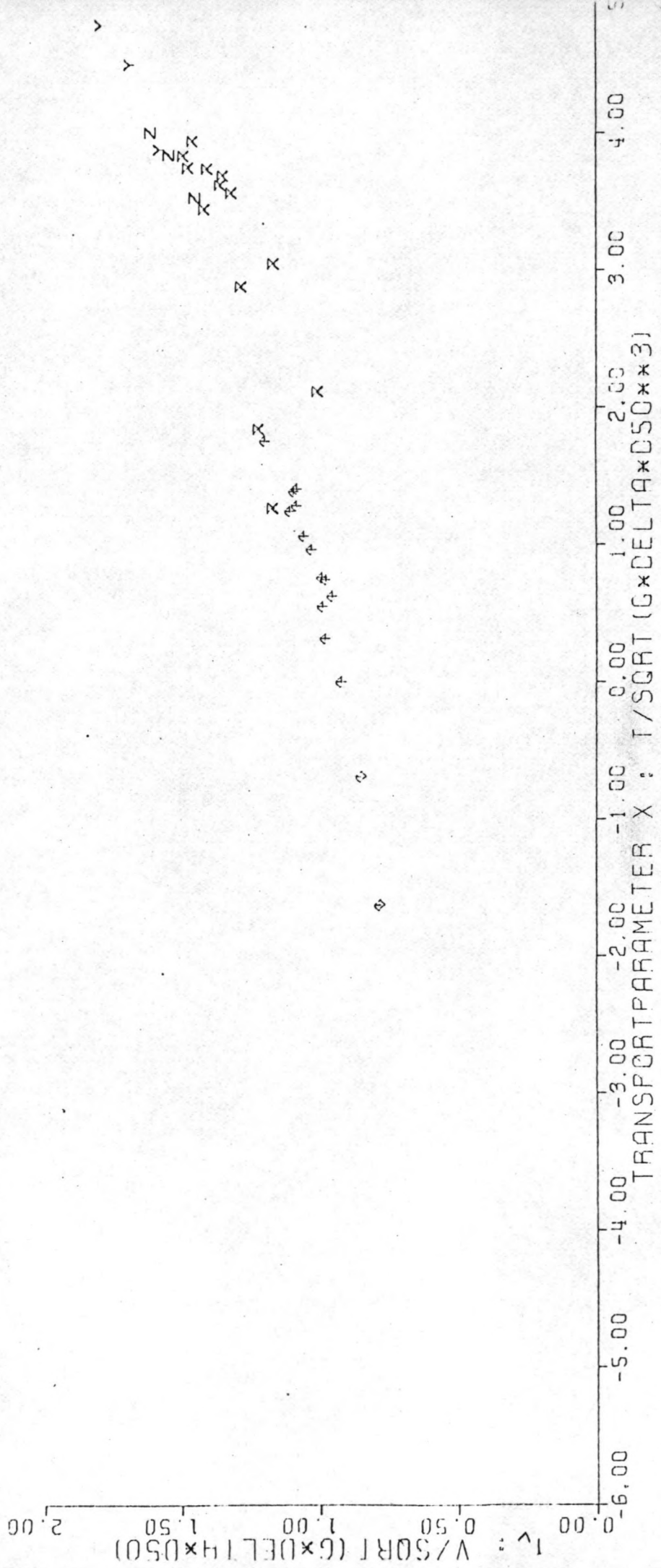


FIG. 5.60

Fig. 5.61 t/m 5.75 : Relatie tussen X , Y_{v*} , Y_v en $\frac{R_b}{D_{90}}$ volgens Rottner.

INTERVAL 1 : $\frac{R_3}{D_{90}} < 7.1$

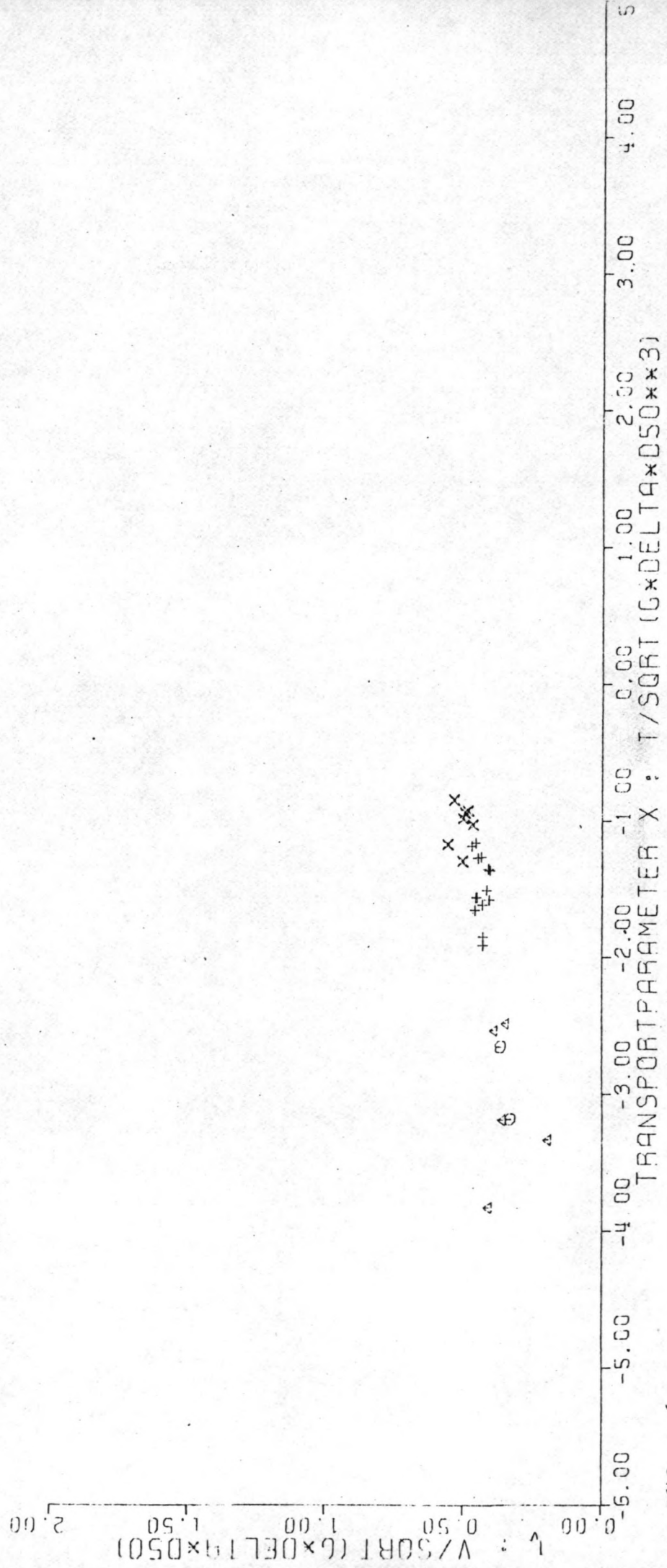


FIG. 5.61

INTERVAL 2 : : $7.1 < \frac{R_B}{D_{90}} \leq 10$

$$\text{ROTTNER. } X = \left[\left\{ 0.667 \left(\frac{R_B}{D_{90}} \right)^{-3} + 0.14 \right\} Y_{cr} - 0.778 \left(\frac{R_B}{D_{90}} \right)^{-\frac{1}{6}} \right]^3$$

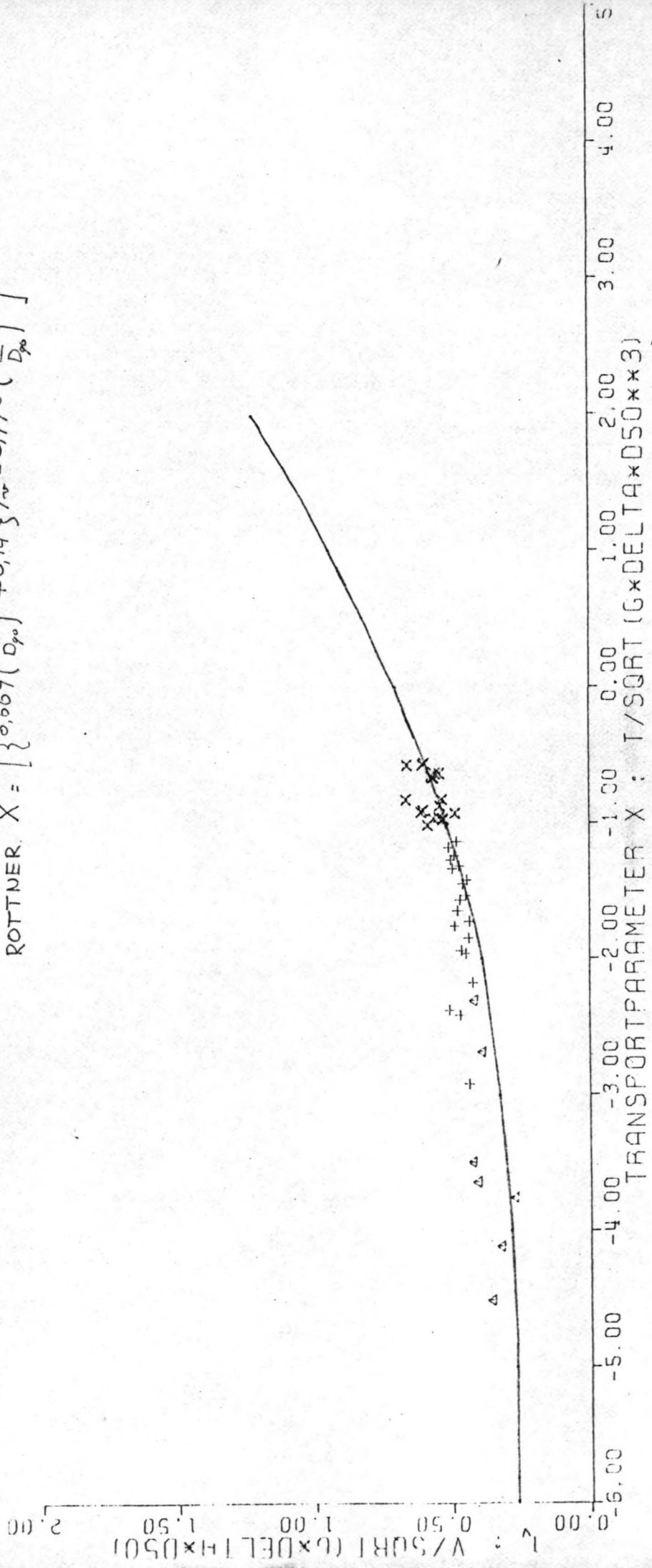


FIG. 5.62

INTERVAL 3 : $10 < \frac{R_B}{D_{p0}} \leq 15$

$$\text{ROTTNER: } X = \left[\left\{ 0.667 \left(\frac{R_B}{D_{p0}} \right)^{-\frac{1}{3}} + 0.14 \right\} Y_v - 0.778 \left(\frac{R_B}{D_{p0}} \right)^{-\frac{1}{6}} \right]^3$$

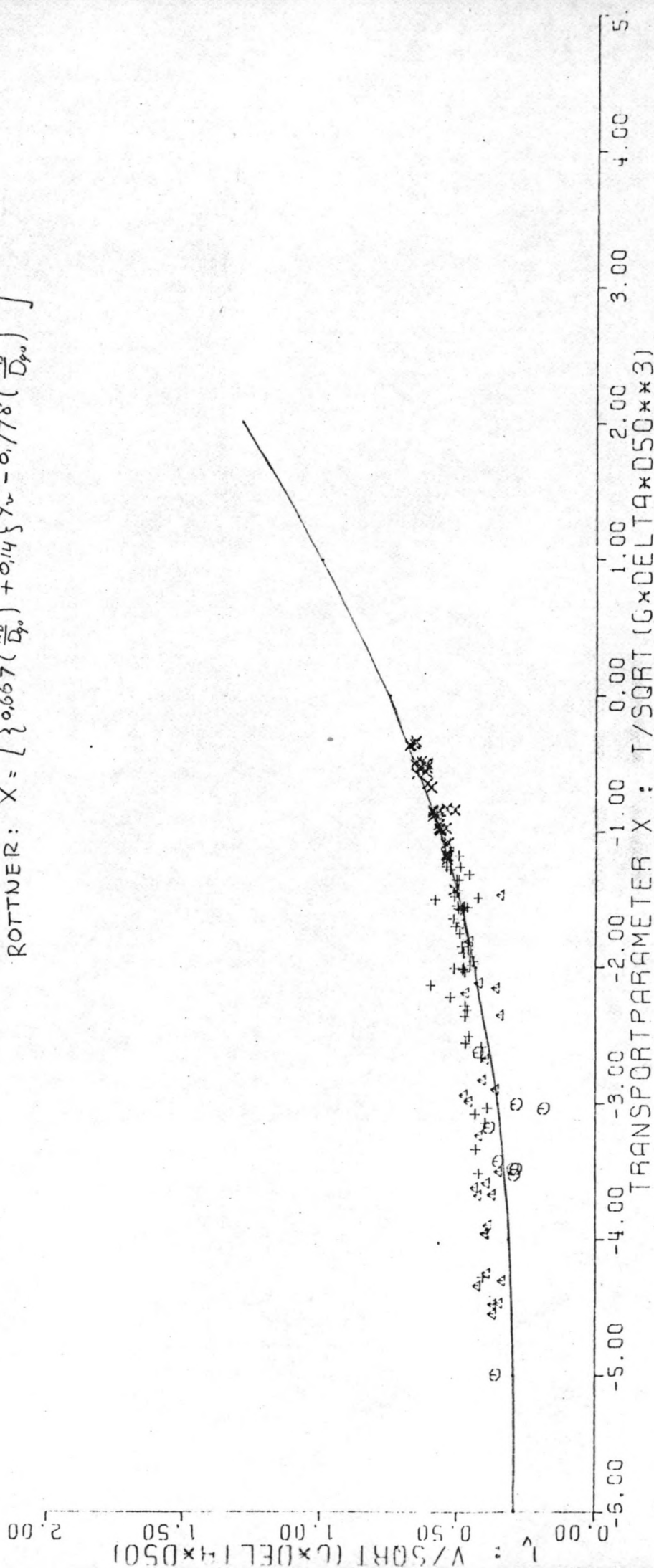


FIG. 5.63

INTERVAL 4 : $15 < \frac{R_B}{D_p} \leq 21$.

$$\text{ROTTNER: } X = \left[\left\{ 0.667 \left(\frac{R_B}{D_p} \right)^{-\frac{2}{3}} + 0.14 \right\} Y - 0.778 \left(\frac{R_B}{D_p} \right)^{-\frac{1}{6}} \right]^3$$

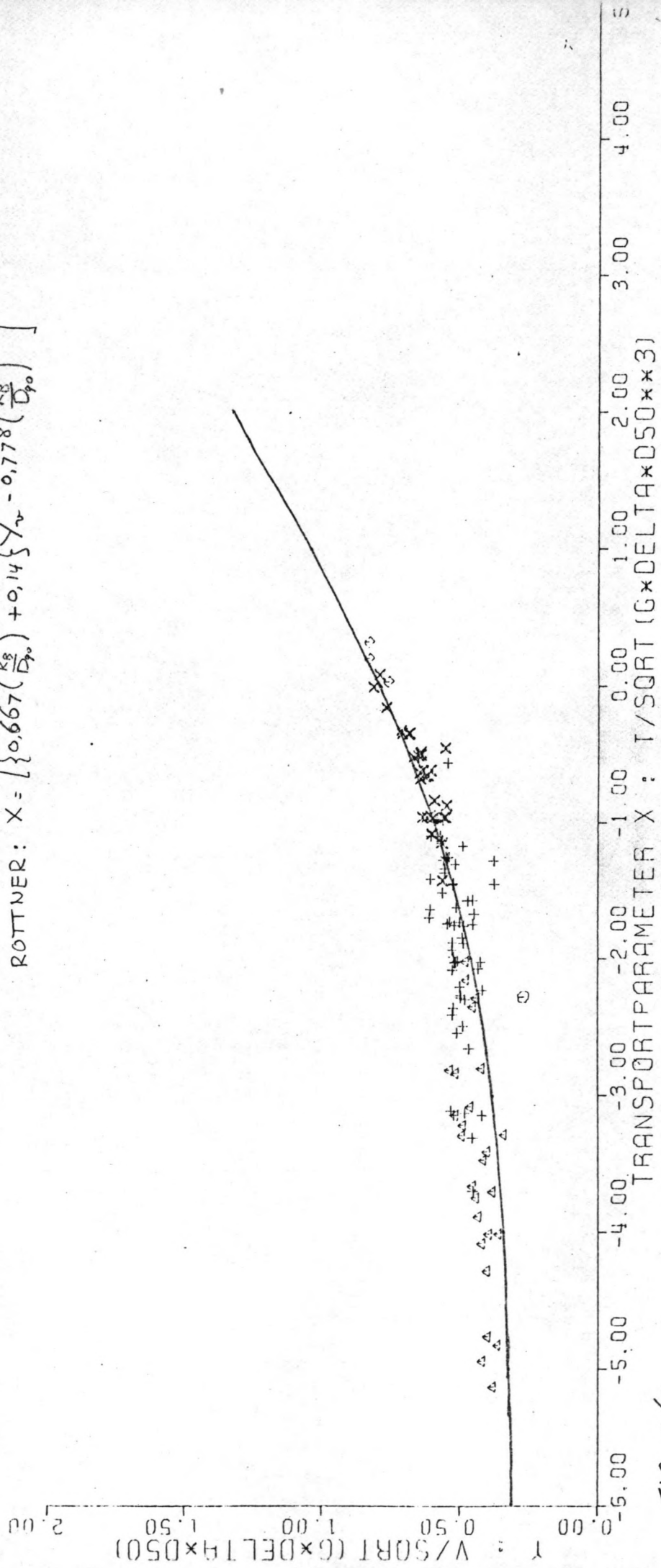


FIG. 5.64

INTERVAL 5 : $21 < \frac{R_B}{D_0} \leq 31$

$$\text{ROTTNER: } X = \left[\left\{ 0.667 \left(\frac{R_B}{D_0} \right)^{-\frac{2}{3}} + 0.14 \right\} Y_2 - 0.778 \left(\frac{R_B}{D_0} \right)^{-\frac{1}{6}} \right]^3$$

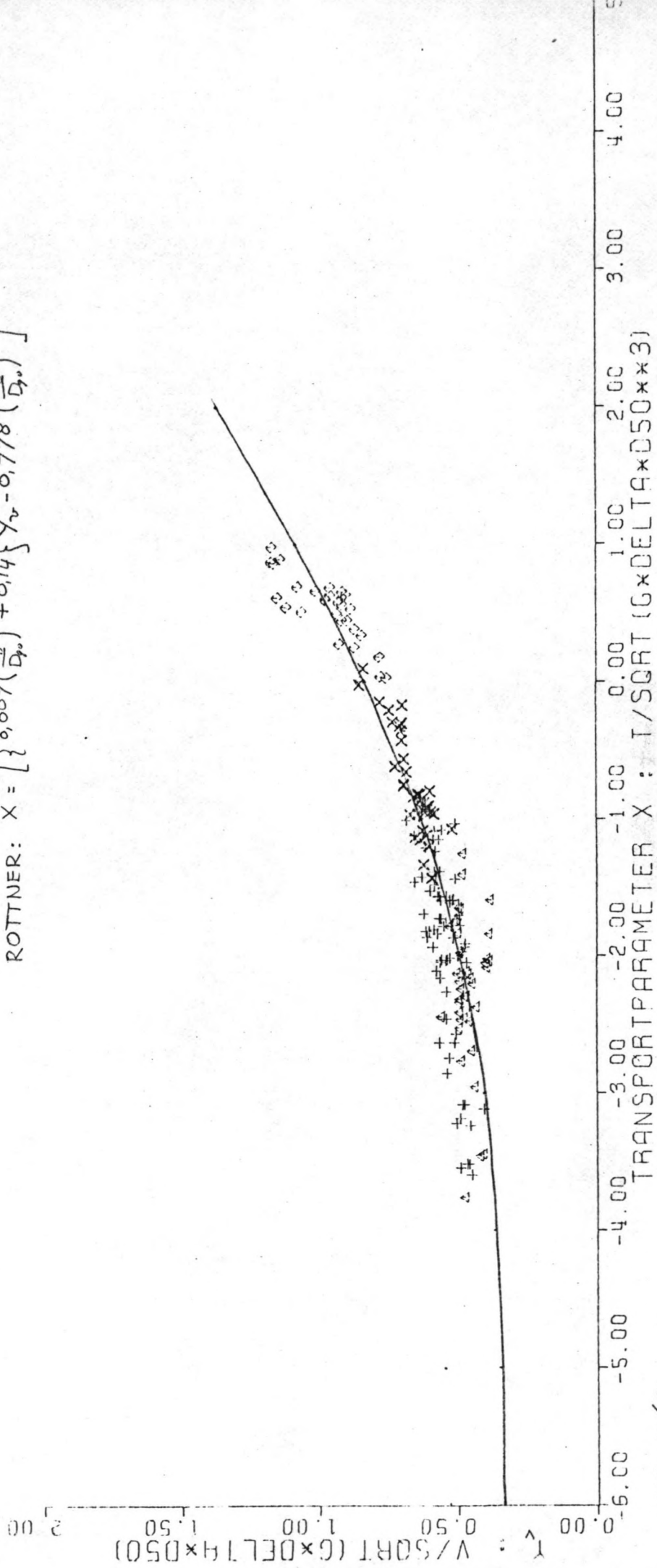


FIG. 5.65

INTERVAL δ : $31 < \frac{R_B}{D_{p0}} \leq 49$

$$\text{ROTTNER: } X = \left[\left\{ 0.667 \left(\frac{R_B}{D_{p0}} \right)^{-\frac{2}{3}} + 0.14 \right\} Y_{\infty} - 0.778 \left(\frac{R_B}{D_{p0}} \right)^{-\frac{1}{6}} \right]^3$$

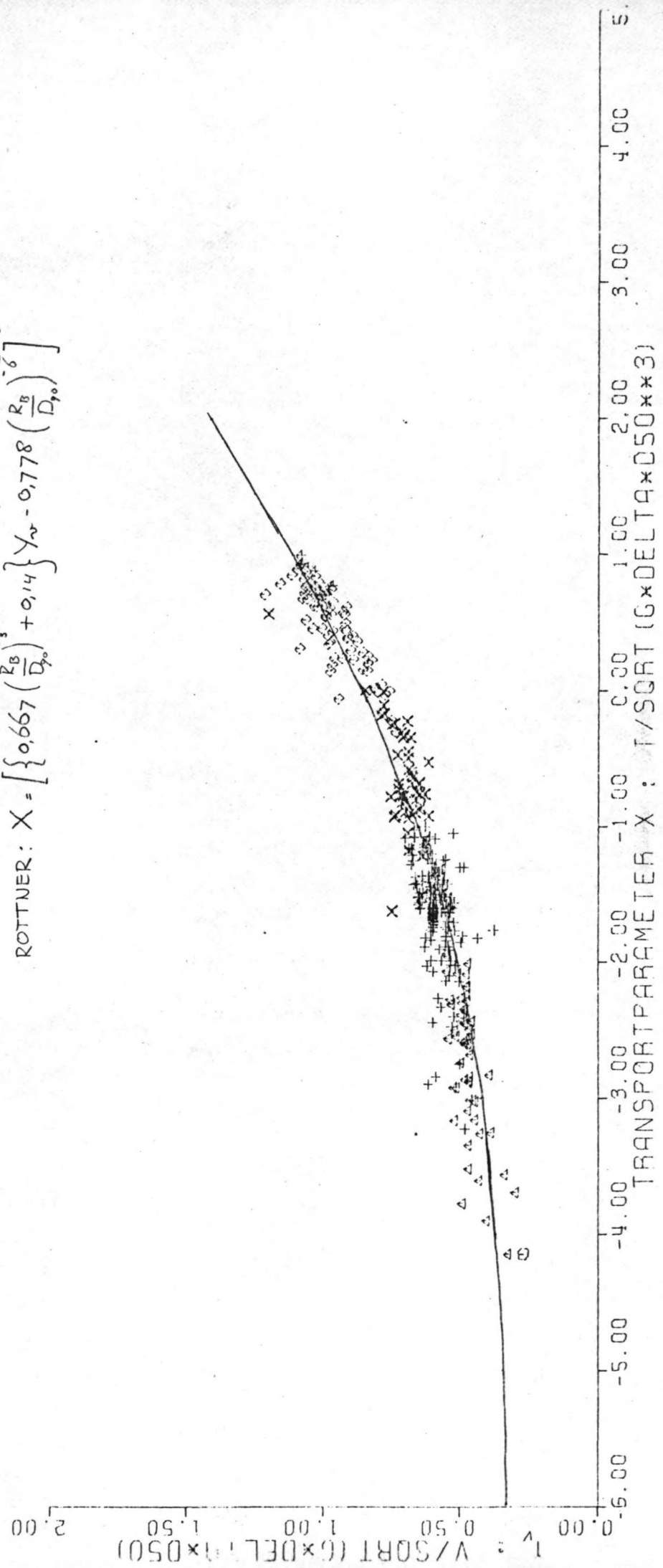


FIG. 5.66

INTERVAL 7 : $49 < \frac{R_B}{D_{90}} \leq 71$

$$\text{ROTTNER: } X = \left[\left\{ 0.667 \left(\frac{R_B}{D_{90}} \right)^{\frac{2}{3}} + 0.14 \right\} \gamma - 0.778 \left(\frac{R_B}{D_{90}} \right)^{-\frac{1}{6}} \right]^3$$

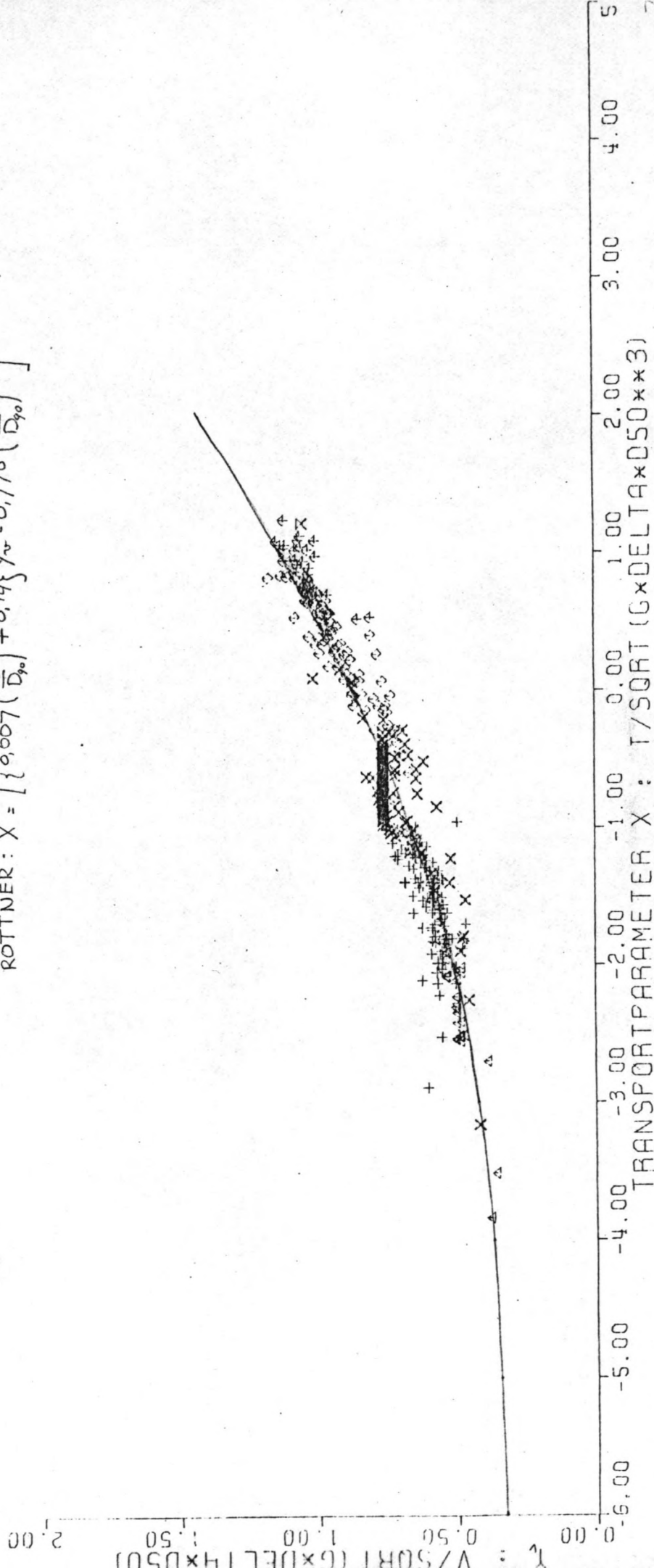


FIG. 5.67

INTERVAL 8 : $71 < \frac{R_B}{D_{90}} \leq 100$

$$\text{ROTTNER: } X = \left[\left\{ 0.667 \left(\frac{R_B}{D_{90}} \right)^{-\frac{2}{3}} + 0.14 \right\} Y_T - 0.778 \left(\frac{R_B}{D_{90}} \right)^{-\frac{1}{6}} \right]^3$$

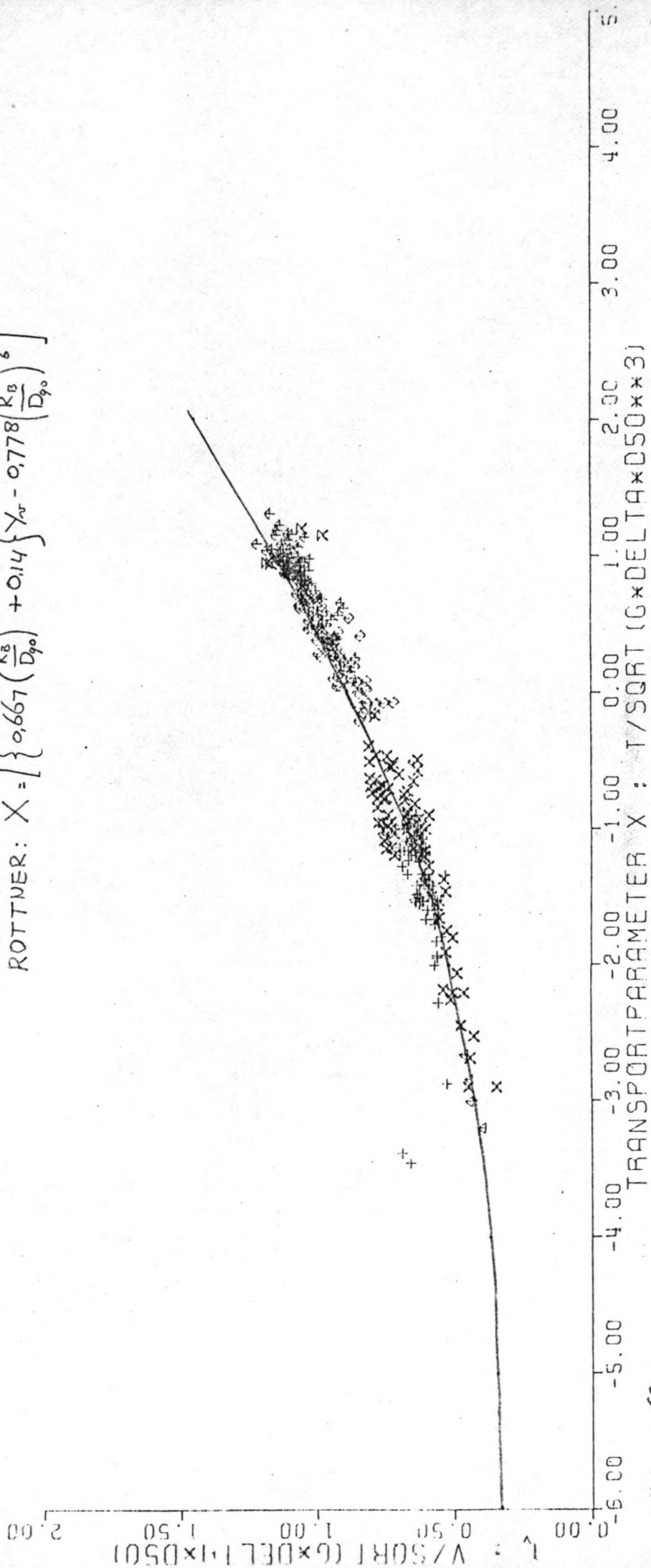


FIG. 5.68

INTERVAL 9 : $100 < \frac{R_B}{D_{90}} \leq 150$

$$\text{ROTTNER: } X = \left[0.667 \left(\frac{R_B}{D_{90}} \right)^{\frac{2}{3}} + 0.14 \right] \gamma_w - 0.778 \left(\frac{R_B}{D_{90}} \right)^{\frac{1}{6}} \Bigg]^3$$

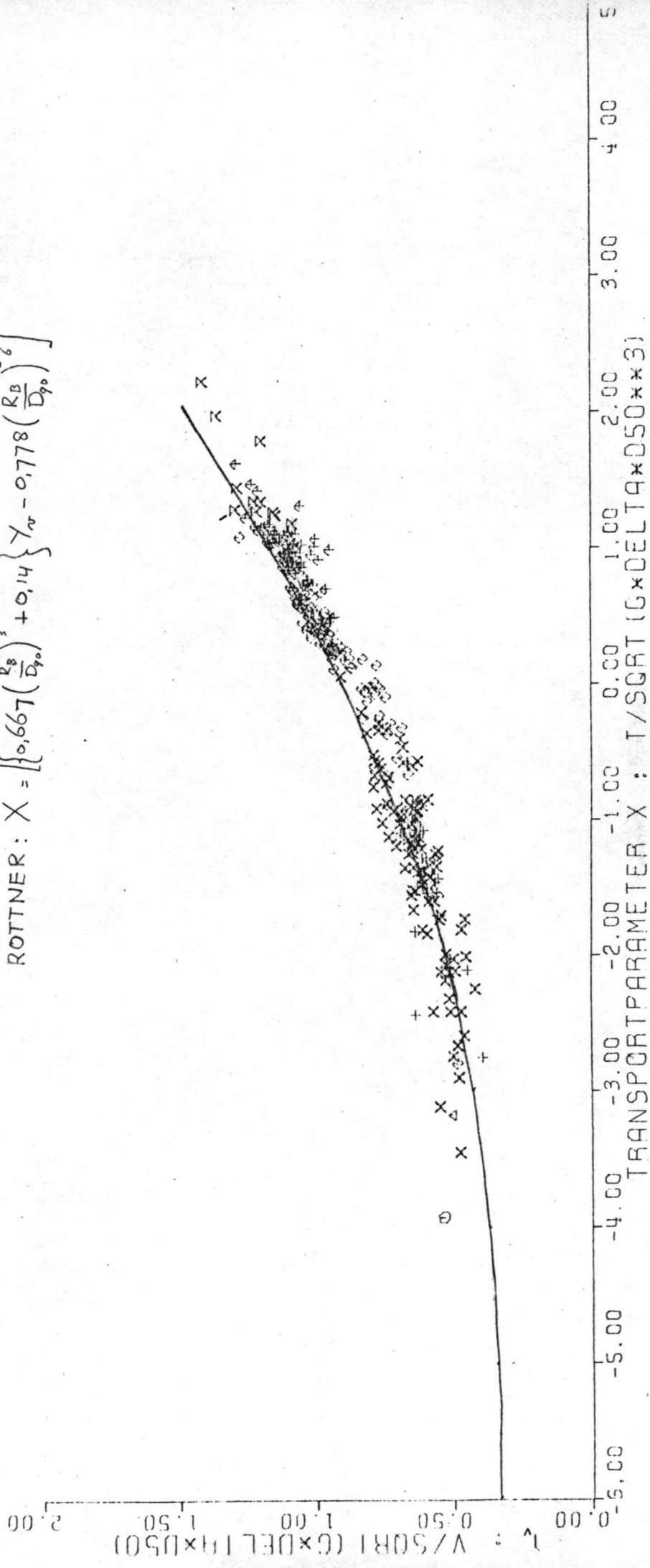


FIG. 5.69

INTERVAL 10 : $150 < \frac{R_B}{D_{90}} \leq 210$

$$\text{ROTTNER : } X = \left[\left\{ 0.667 \left(\frac{R_B}{D_{90}} \right)^{\frac{2}{3}} + 0.14 \right\} Y - 0.778 \left(\frac{R_B}{D_{90}} \right)^{-\frac{1}{6}} \right]^2$$

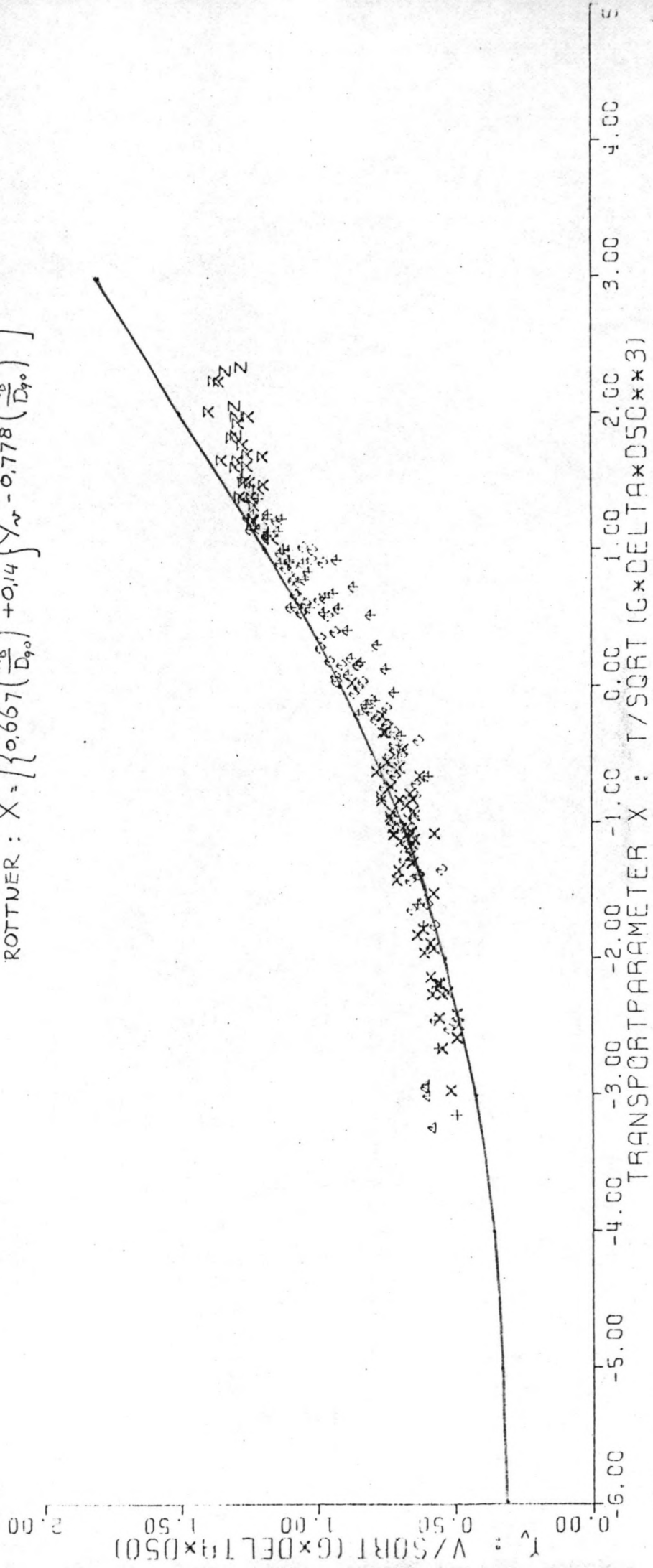


FIG. 5.70

INTERVAL II : $2.10 < \frac{R_B}{D_{90}} \leq 3.10$

$$\text{ROTTNER : } X = \left[\left\{ 0.667 \left(\frac{R_G}{D_{90}} \right)^{-\frac{2}{3}} + 0.14 \right\} \gamma_w - 0.778 \left(\frac{R_B}{D_{90}} \right)^{-\frac{1}{2}} \right]^3$$

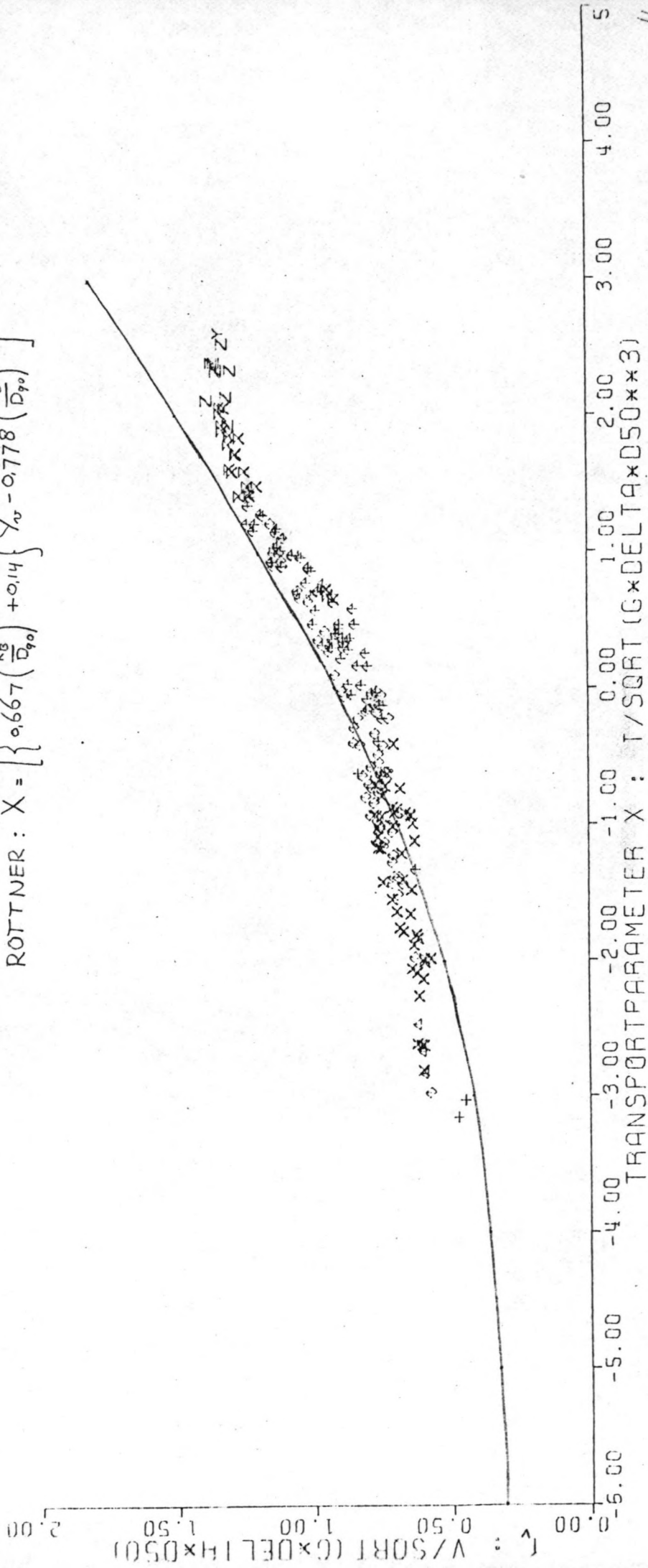


FIG. 5.71

INTERVAL 12 : $310 < \frac{R_B}{D_{90}} \leq 490$

$$\text{ROTTNER: } X = \left[\left\{ 0.667 \left(\frac{R_B}{D_{90}} \right)^3 + 0.14 \right\} Y - 0.778 \left(\frac{R_B}{D_{90}} \right)^{-1/2} \right]^3$$

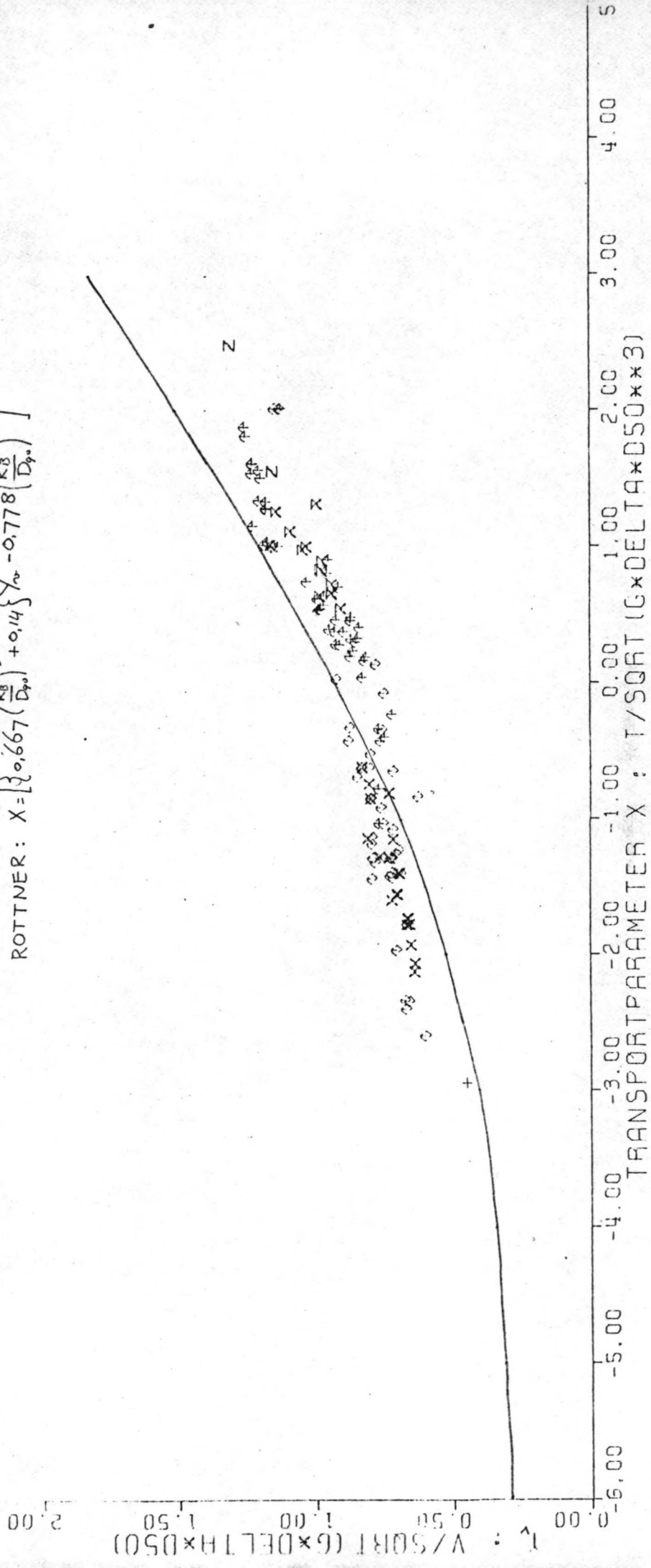


FIG. 5-72

INTERVAL 13 : 490 < $\frac{R_B}{D_{90}} \leq 710$

$$\text{ROTTNER: } X = \left[\left\{ 0.667 \left(\frac{R_B}{D_{90}} \right)^{\frac{2}{3}} + 0.14 \right\} Y_{90} - 0.778 \left(\frac{R_B}{D_{90}} \right)^{\frac{1}{6}} \right]^3$$

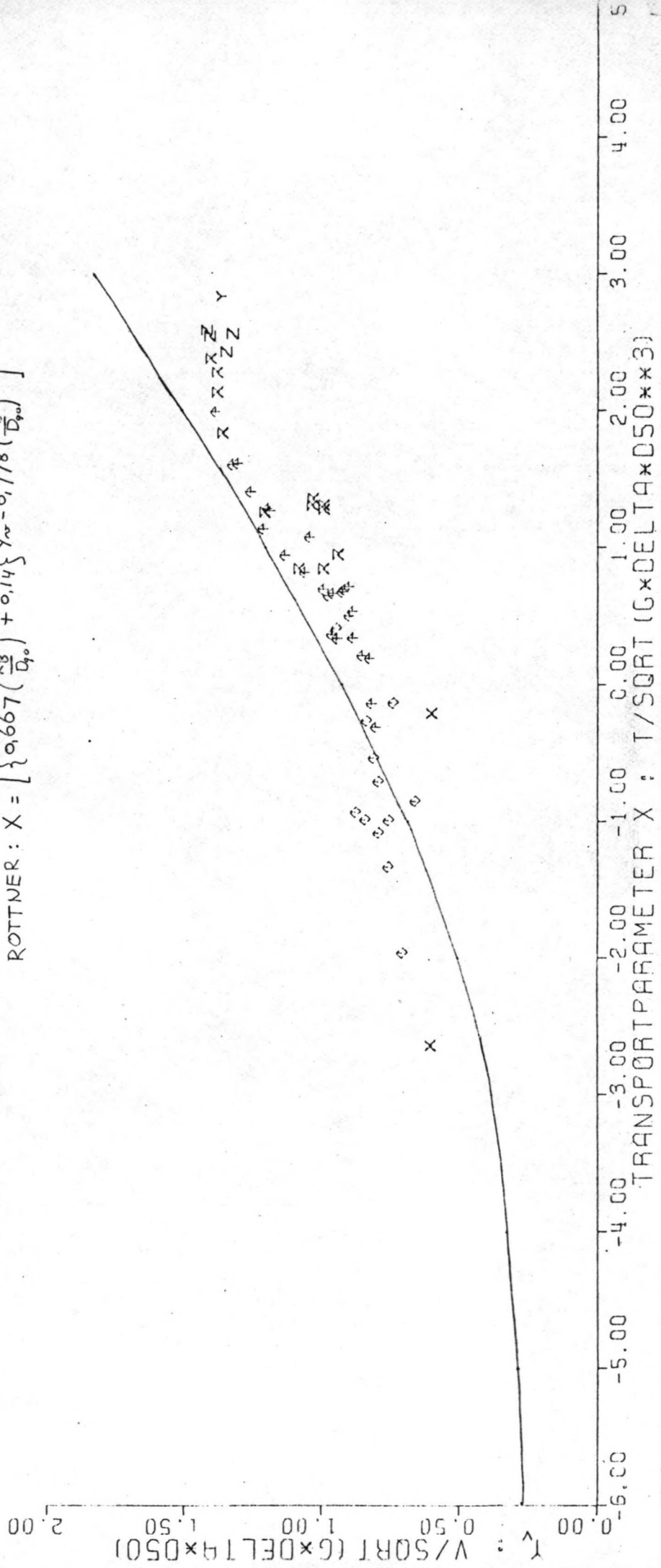


FIG. 5.73

INTERVAL 14 : $710 < \frac{R_B}{D_{90}} \leq 1000$

$$\text{ROTTNER: } X = \left[\left\{ 0.667 \left(\frac{R_B}{D_{90}} \right)^{-\frac{2}{3}} + 0.14 \right\} \gamma_v - 0.778 \left(\frac{R_B}{D_{90}} \right)^{-\frac{1}{2}} \right]^3$$

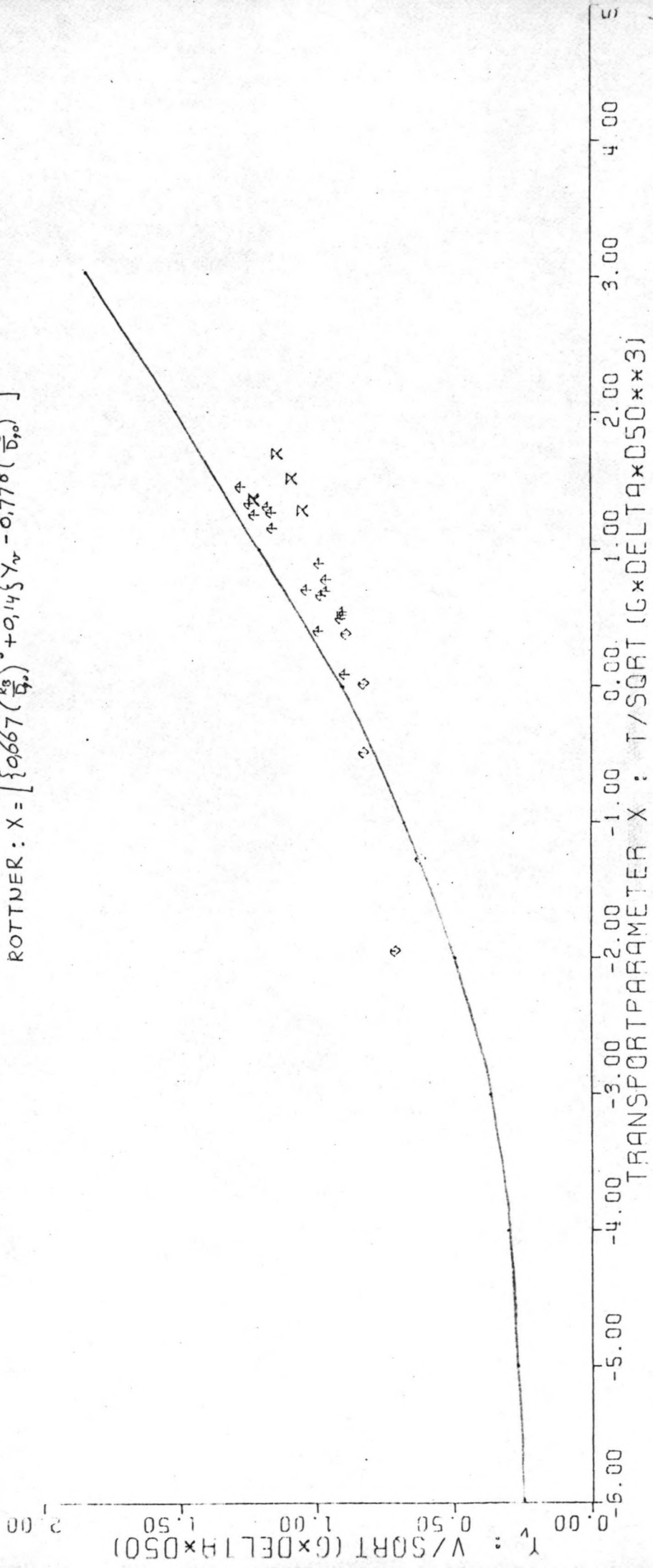


FIG. 5.74

INTERVAL 15 : $\frac{R_B}{D_{90}} > 1000$

ROTTNER

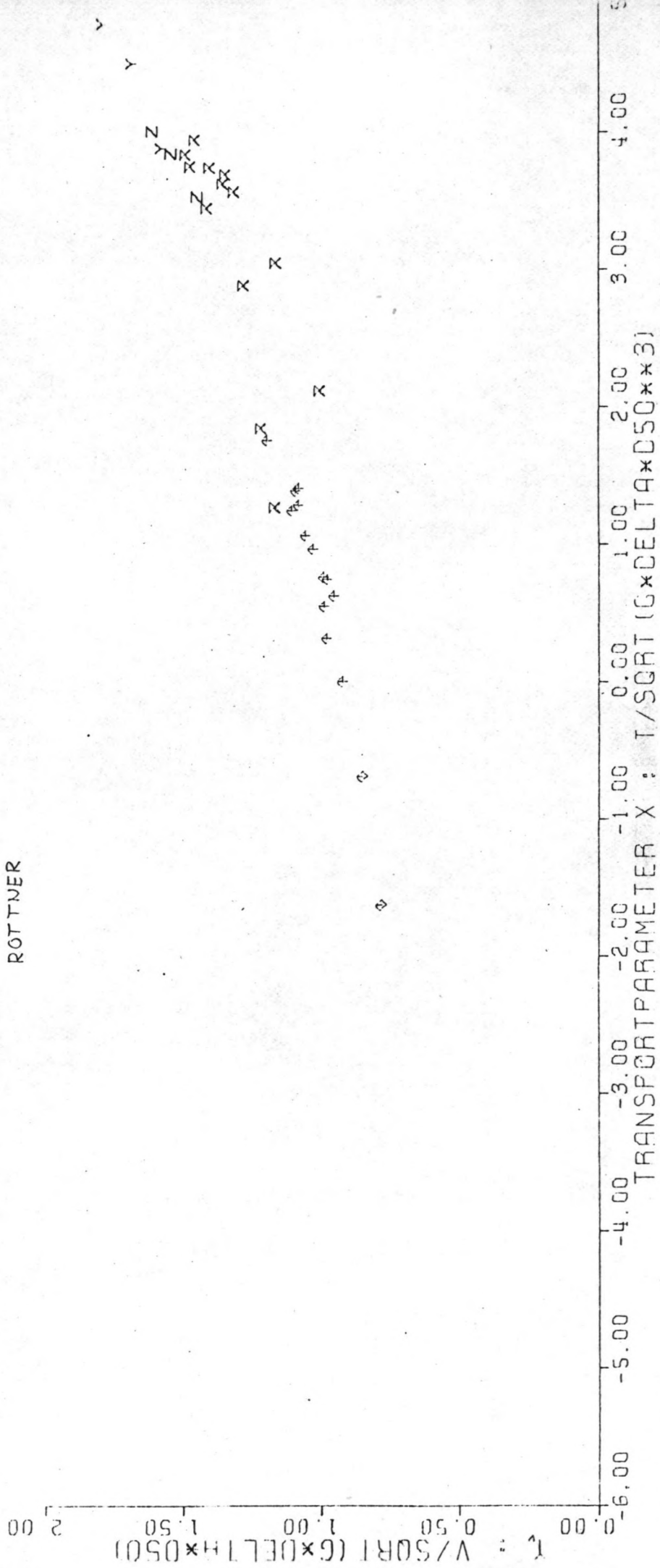
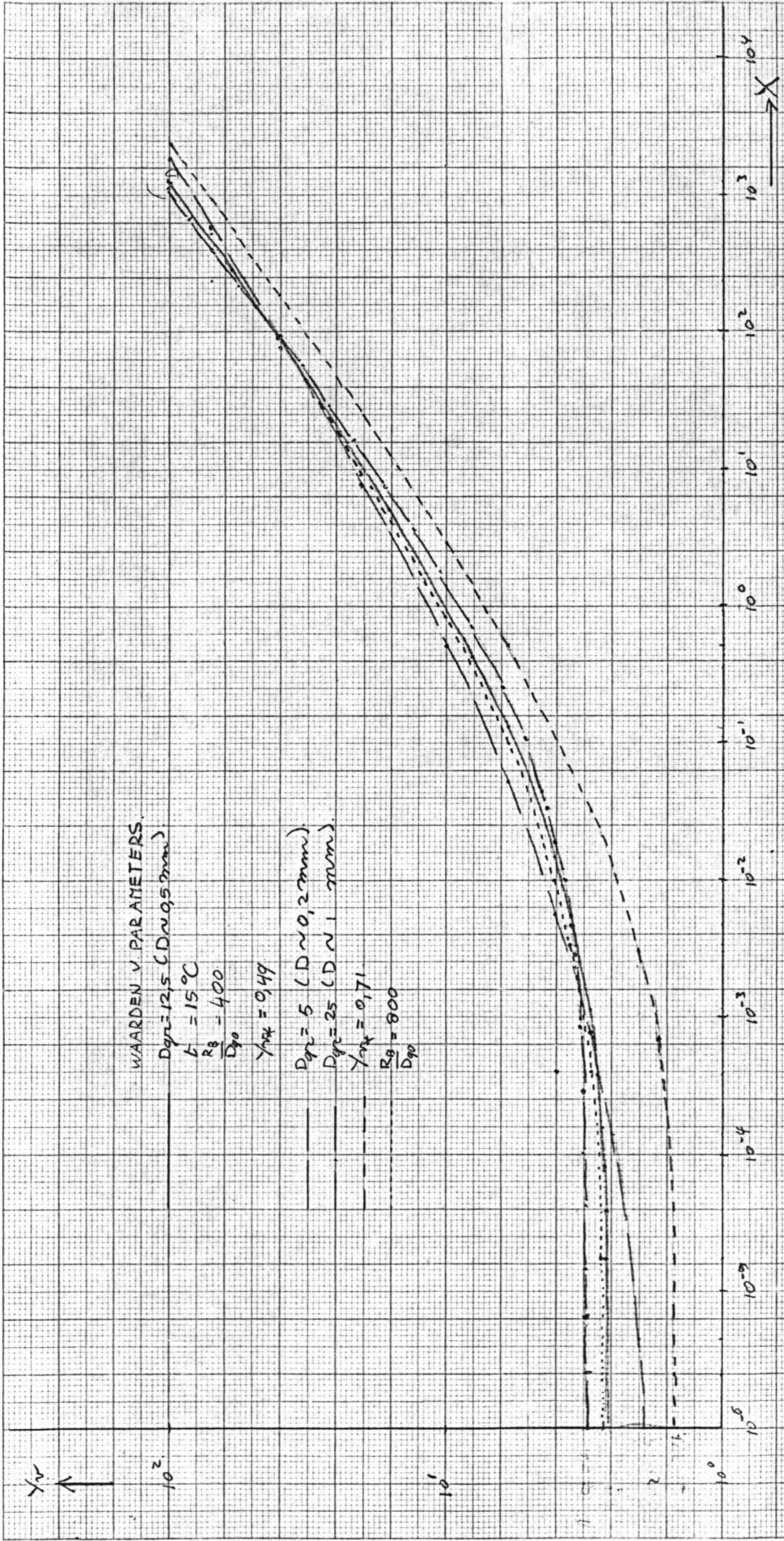


FIG. 5.75

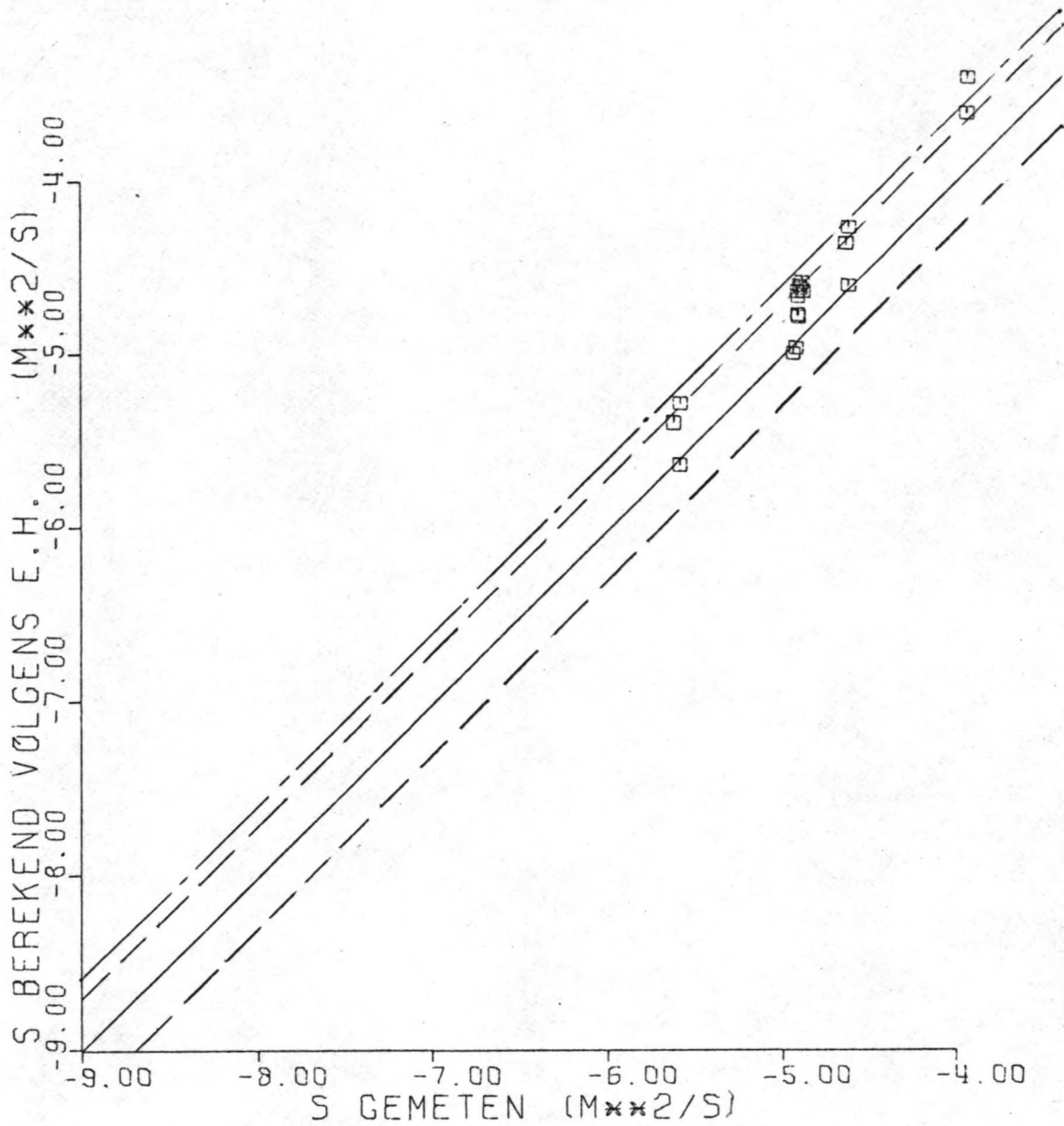


WAARDEN V. PARAMETERS.

- $D_{gr} = 12,5$ (D.N. 0,5 mm)
- $t = 15^\circ C$
- $R_g = 400$
- D_{90}
- $\gamma_{gr} = 0,49$
- $D_{gr} = 5$ (D.N. 0,2 mm)
- $D_{gr} = 25$ (D.N. 1 mm)
- - - $\gamma_{gr} = 0,71$
- - - $R_g = 800$
- - - D_{90}

Fig. 5.106 Relatie tussen X en Y_V volgens Ackers en White, voor verschillende waarden van de parameters

$U^1 D_{gr}, Y_V, C^1$

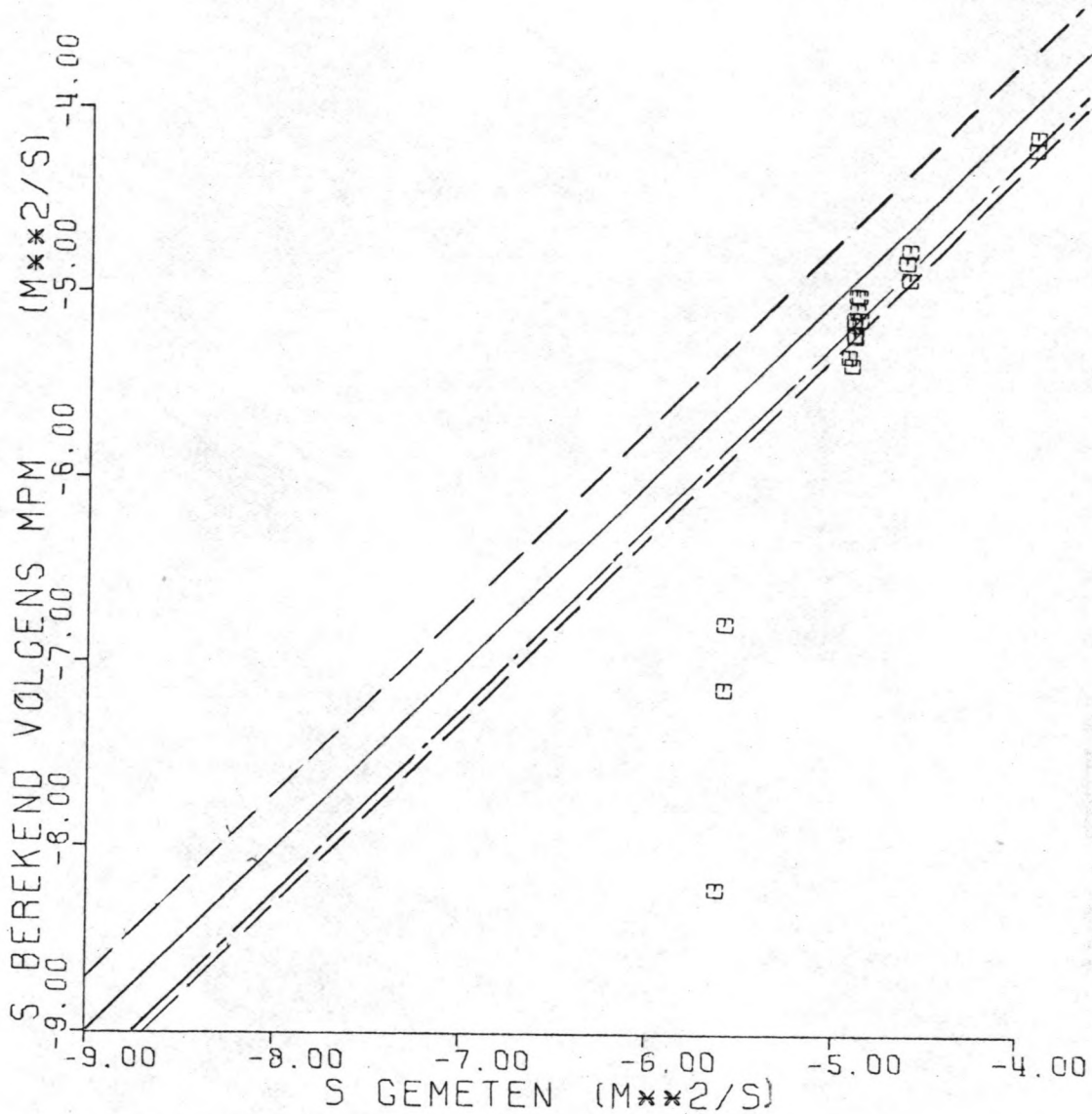


Gootmetingen W.L. De Voorst.

Correlatiecoëfficiënt : 0,96.

- Lijn van volledige overeenstemming.
- - - - - Regressielijn $S_{\text{ber.}} = 2,60 \cdot S_{\text{gemeten}}$.
- - - - - $S_{\text{ber.}}/S_{\text{gemeten}}$ is respectievelijk 2 en 1/2.

Fig. 6.1 Vergelijking gemeten en berekende transport volgens E.H.

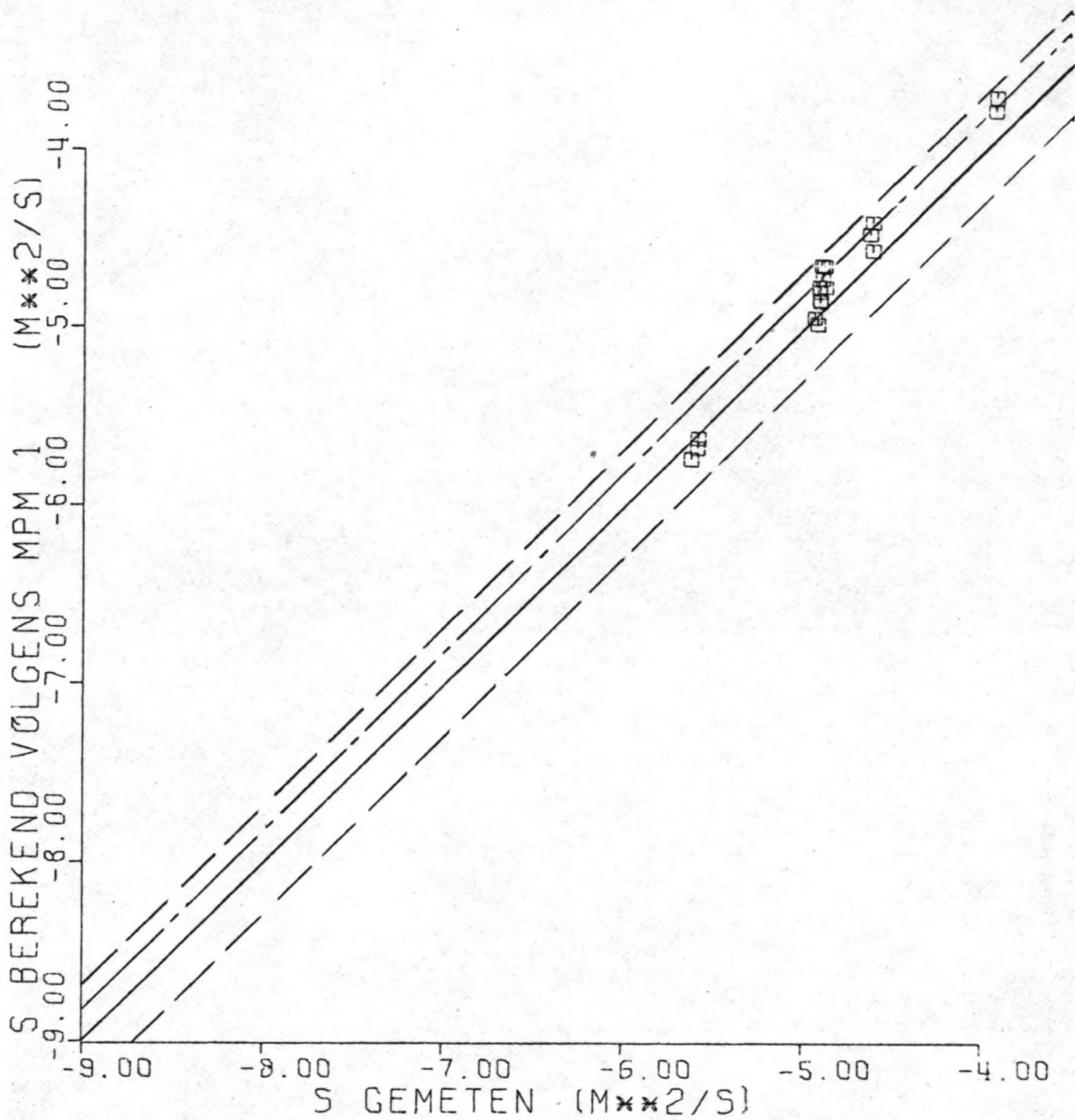


Gootmetingen W.L. De Voorst.

Correlatiecoëfficiënt : 0,99.

- Lijn van volledige overeenstemming.
- Regressielijn : $S_{ber.} = 0,58.S_{gemeten}$.
- . - . - $S_{ber.}/S_{gemeten}$ is respectievelijk 2 en 1/2.

Fig. 6.2 Vergelijking gemeten en berekende transport volgens Meyer Peter en Müller.

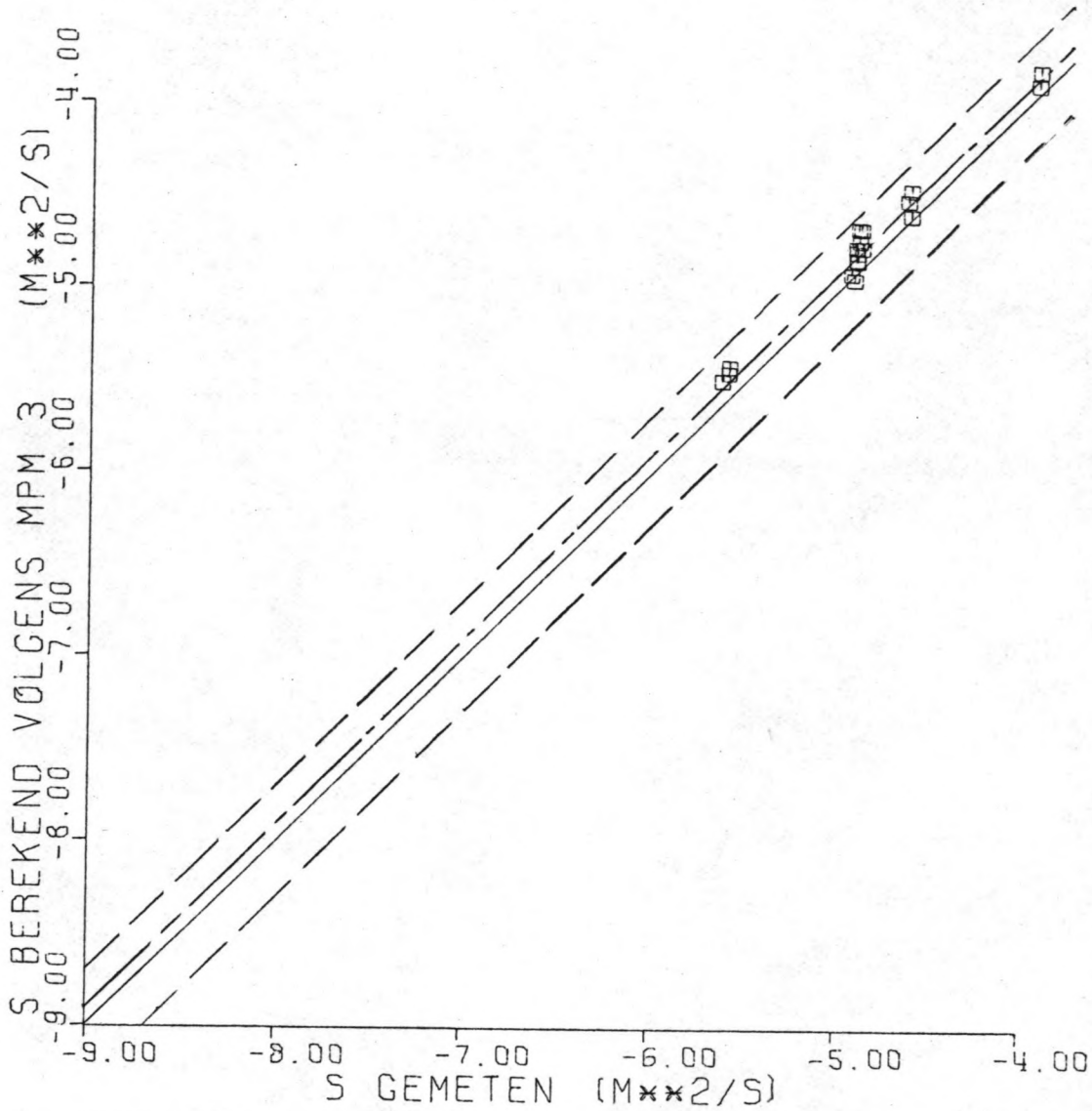


Gootmetingen W.L. De Voorst.

Correlatiecoëfficiënt : 0,99.

- Lijn van volledige overeenstemming.
- - - - - Regressielijn : $S_{ber.} = 1,54 \cdot S_{gemeten}$.
- · - · - $S_{ber.}/S_{gemeten}$ is respectievelijk 2 en 1/2.

Fig. 6.3 Vergelijking gemeten en berekende transport volgens de 1^{ste} modificatie van M.P.M.

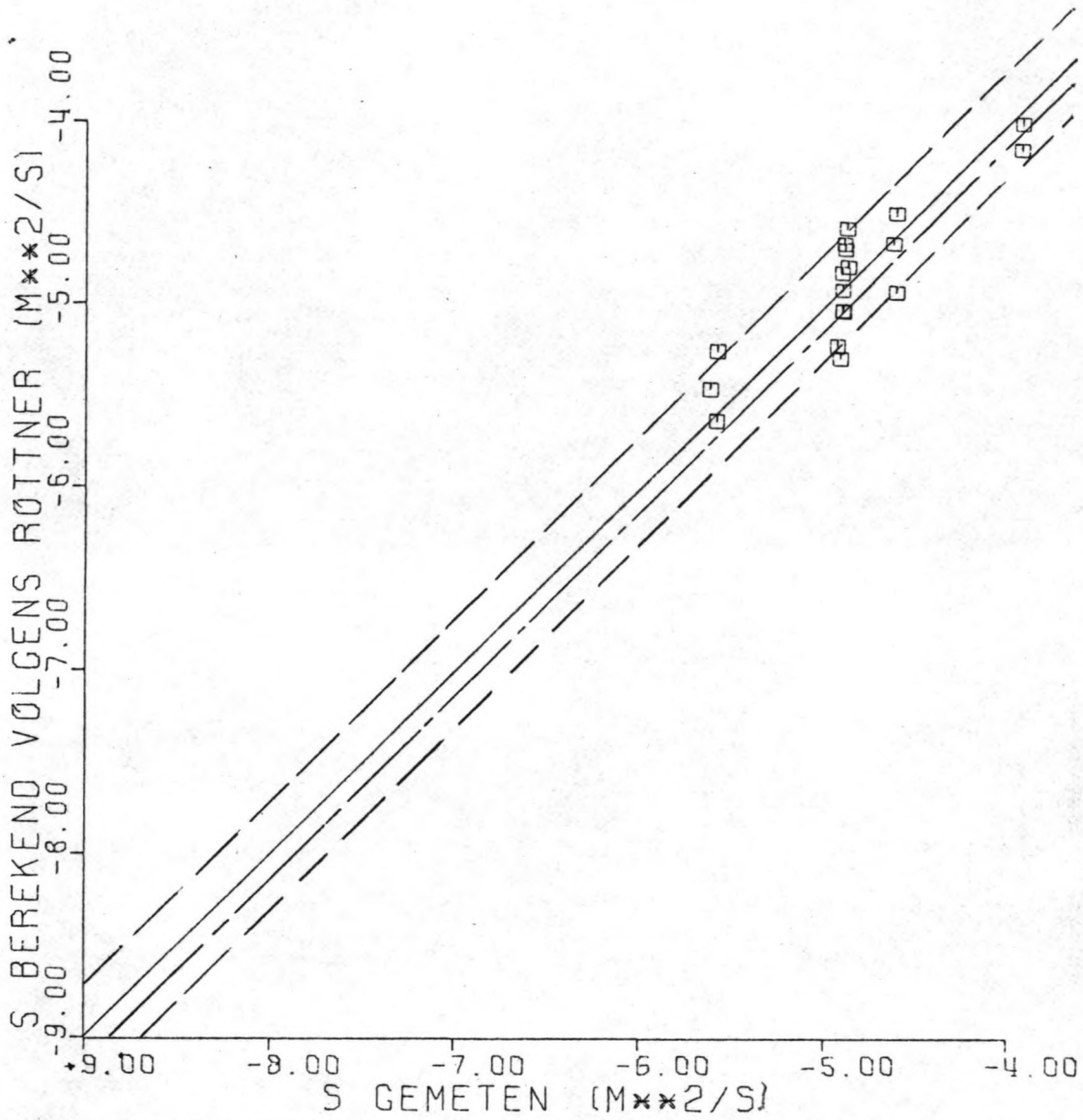


Gootmetingen W.L. De Voorst.

Correlatiecoëfficiënt : 0,99.

- Lijn van volledige overeenstemming.
- - - - - Regressielijn $S_{ber.} = 1,22 \cdot S_{gemeten}$.
- - - - - $S_{ber.} / S_{gemeten}$ is respectievelijk 2 en 1/2.

Fig. 6.4 Vergelijking gemeten en berekende transport volgens de 3^e modificatie van M.P.M.

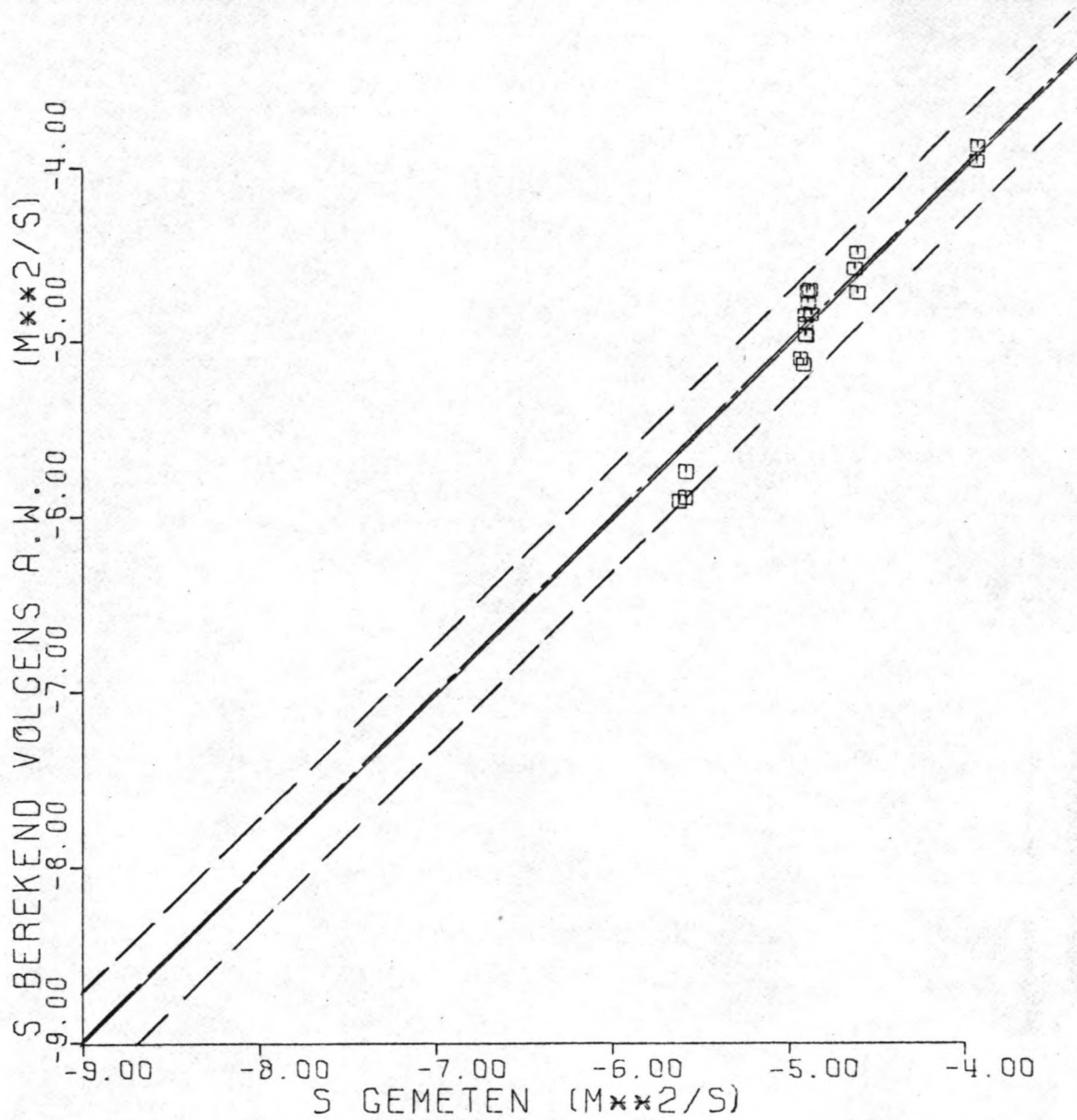


Gootmetingen W.L. De Voorst.

Correlatiecoëfficiënt : 0,95.

- Lijn van volledige overeenstemming.
- Regressielijn $S_{ber.} = 0,75 \cdot S_{gemeten}$.
- . - . - $S_{ber.}/S_{gemeten}$ is respectievelijk 2 en 1/2.

Fig. 6.5 Vergelijking gemeten en berekende transport volgens Rottner.

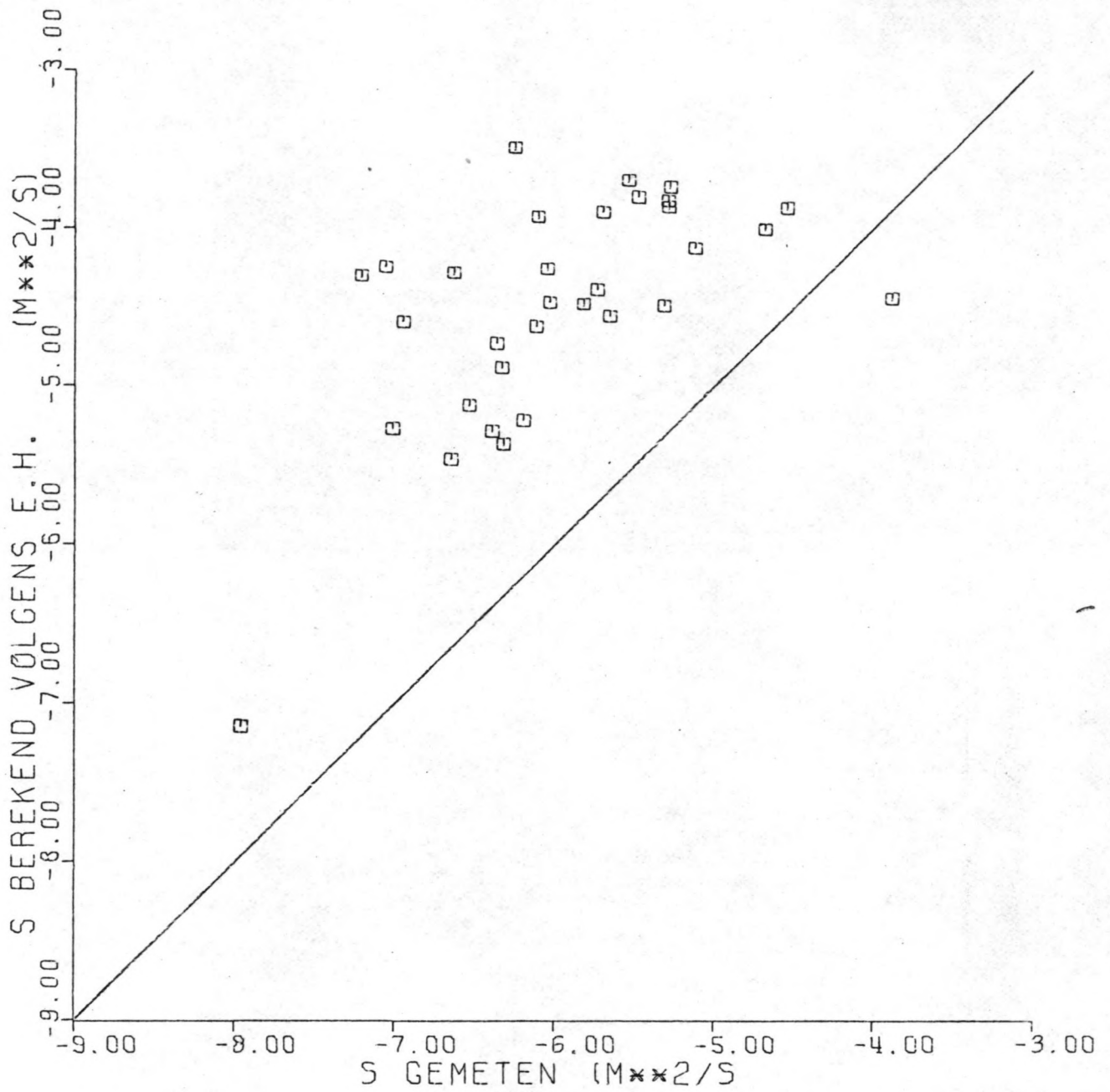


Gootmetingen W.L. De Voorst.

Correlatiecoëfficiënt : 0,99.

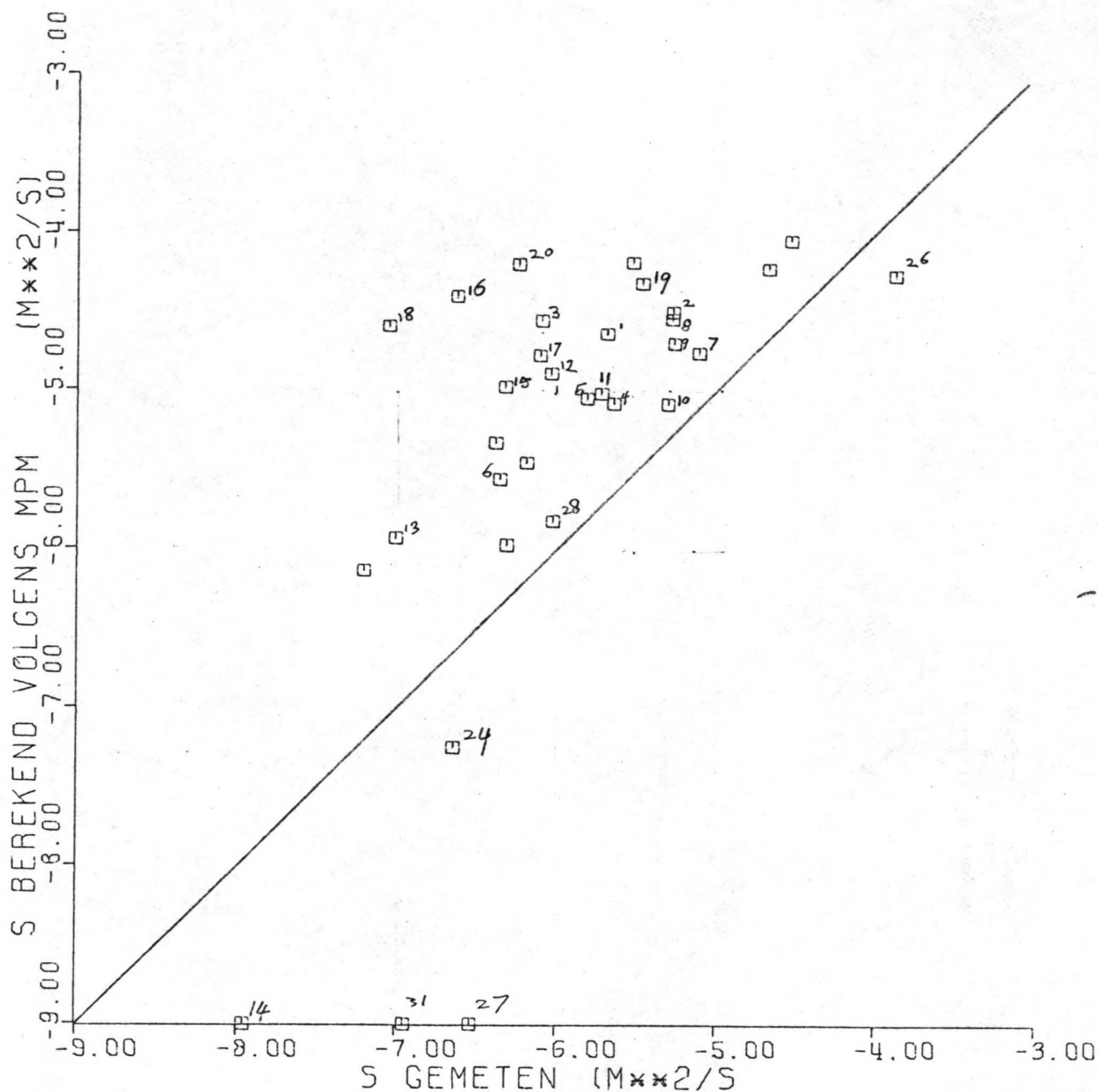
- Lijn van volledige overeenstemming.
- Regressielijn $S_{ber.} = 1,01 \cdot S_{gemeten}$.
- - - - $S_{ber.}/S_{gemeten}$ is respectievelijk 2 en 1/2.

Fig. 6.6 Vergelijking gemeten en berekende transport volgens Ackers en White.



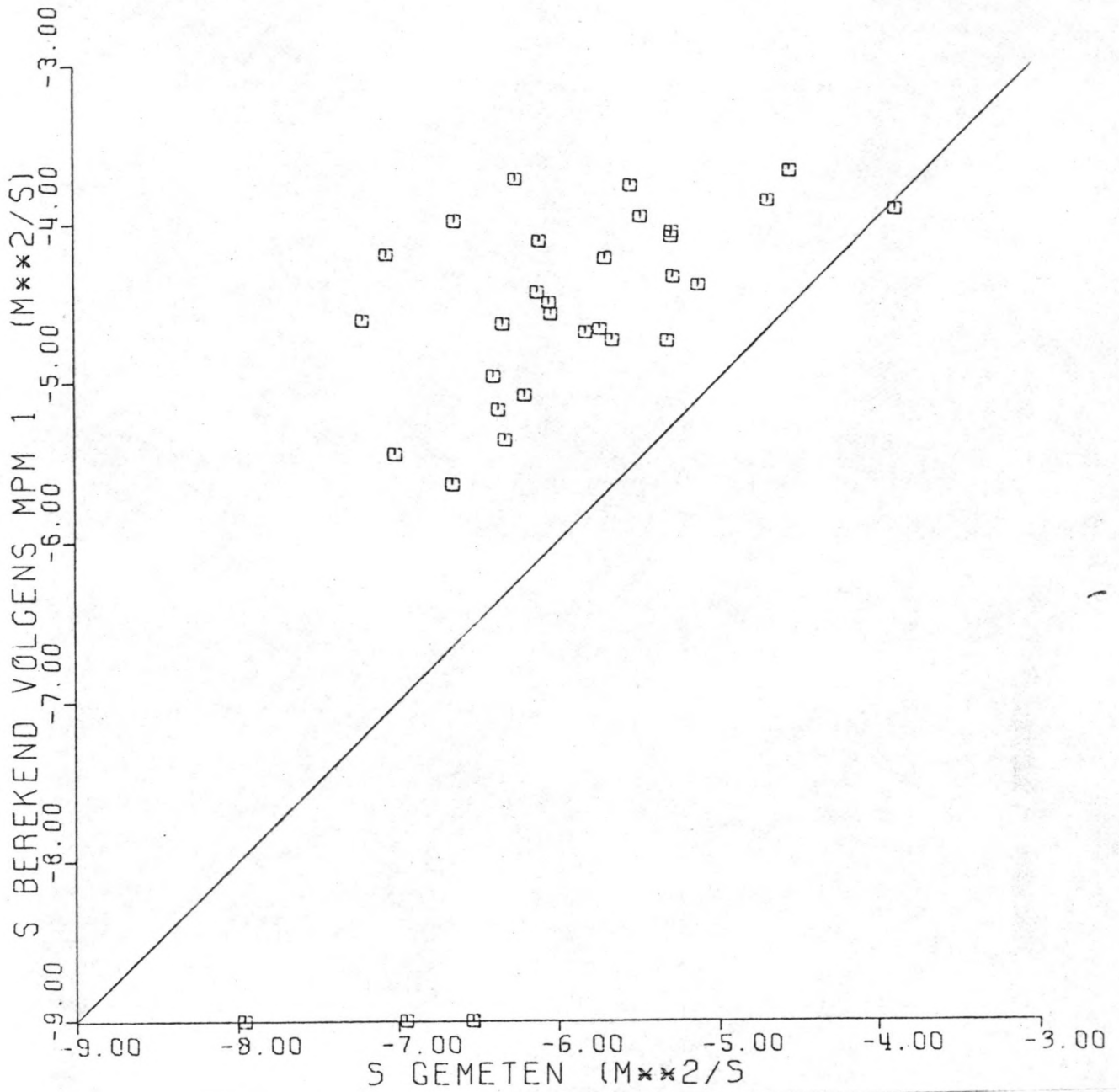
Correlatie-coëfficiënt : 0,00
 Regressielijn : $s_{ber.} = 0,84 \cdot s_{gemeten}$
 Gemiddelde van $s_{ber.}/s_{gemeten}$: 104
 Aantal metingen : 32

Fig. 6.7 Metingen van de IJssel en het Pannerdens kanaal, vergelijking gemeten en berekende transport volgens E.H.



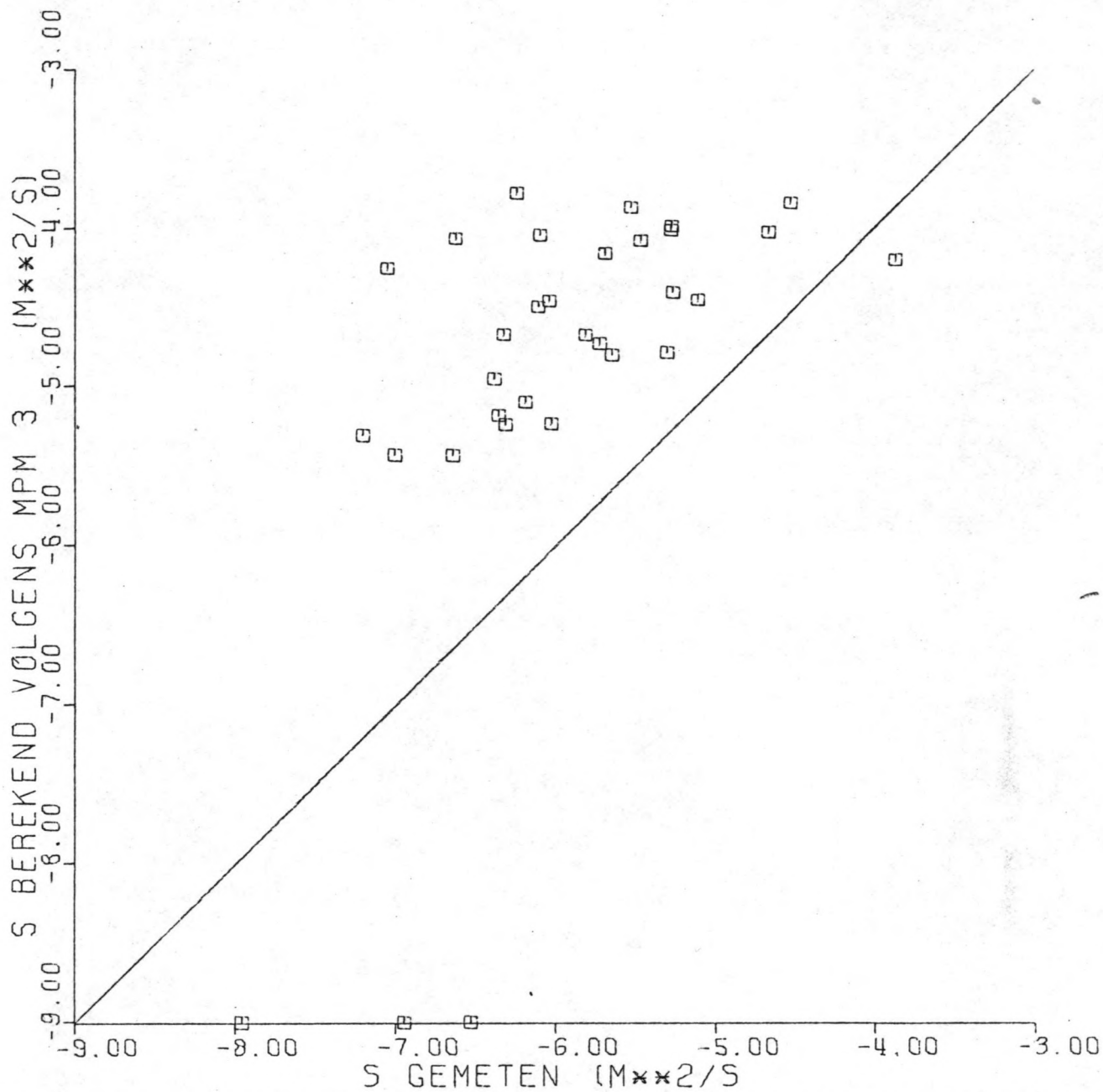
Correlatie-coëfficiënt : 0,41
 Regressielijn : $s_{\text{ber.}} = 0,64 \cdot s_{\text{gemeten}}$
 Gemiddelde van $s_{\text{ber.}}/s_{\text{gemeten}}$: 27,5
 Aantal metingen : 29

Fig. 6.8 Metingen van de IJsel en het Pannerdens kanaal,
 vergelijking gemeten en berekende transport volgens M.P.M.



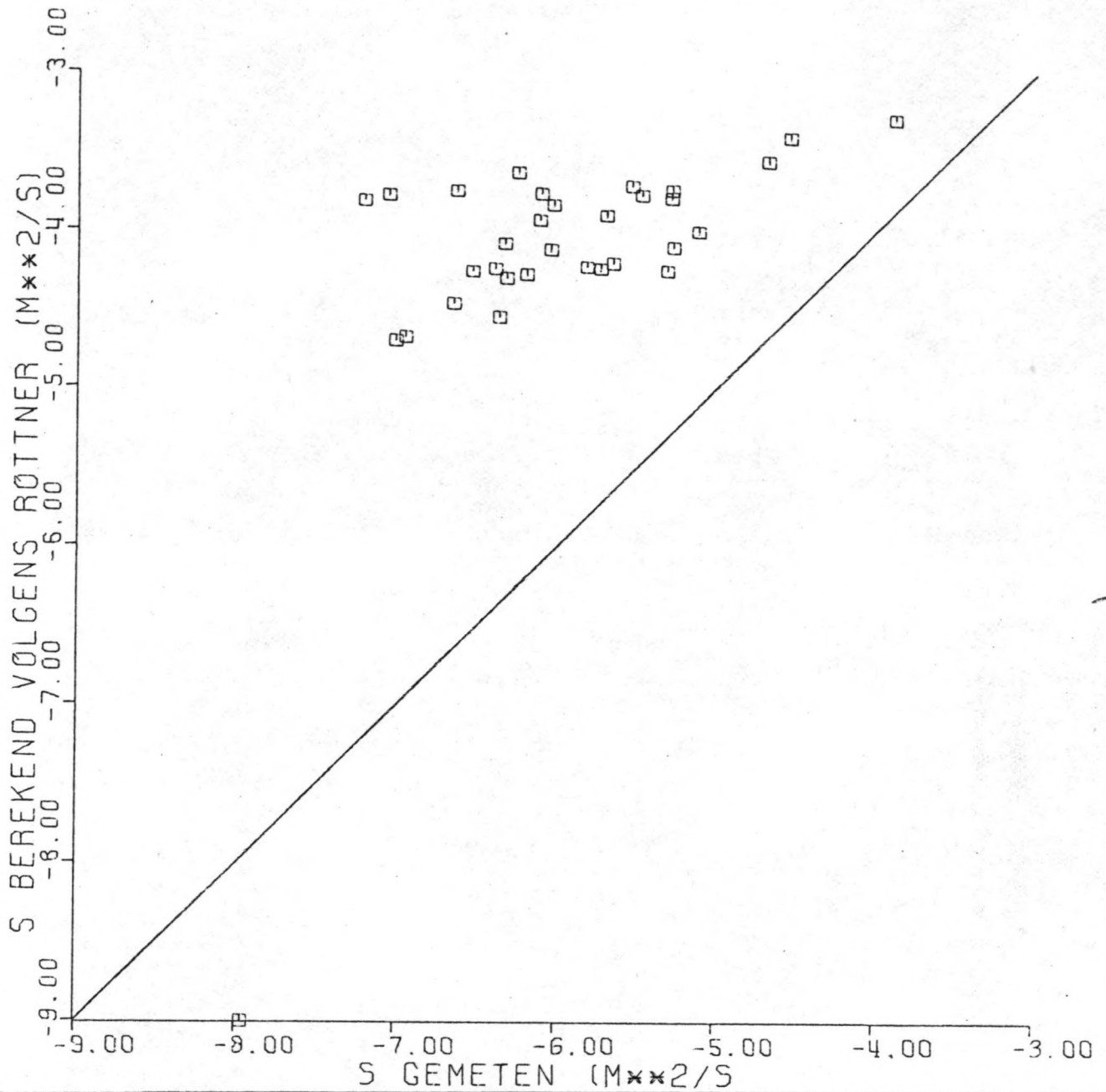
Correlatie-coëfficiënt : 0,34
 Regressielijn : $s_{ber} = 1,48 \cdot s_{gemeten}$
 Gemiddelde van $s_{ber.}/s_{gemeten}$: 86,5
 Aantal metingen : 29

Fig 6.9 Metingen van de IJsel en het Panmerdens kanaal, vergelijking gemeten en berekende transport volgens de 1^{ste} modificatie van M.P.M.



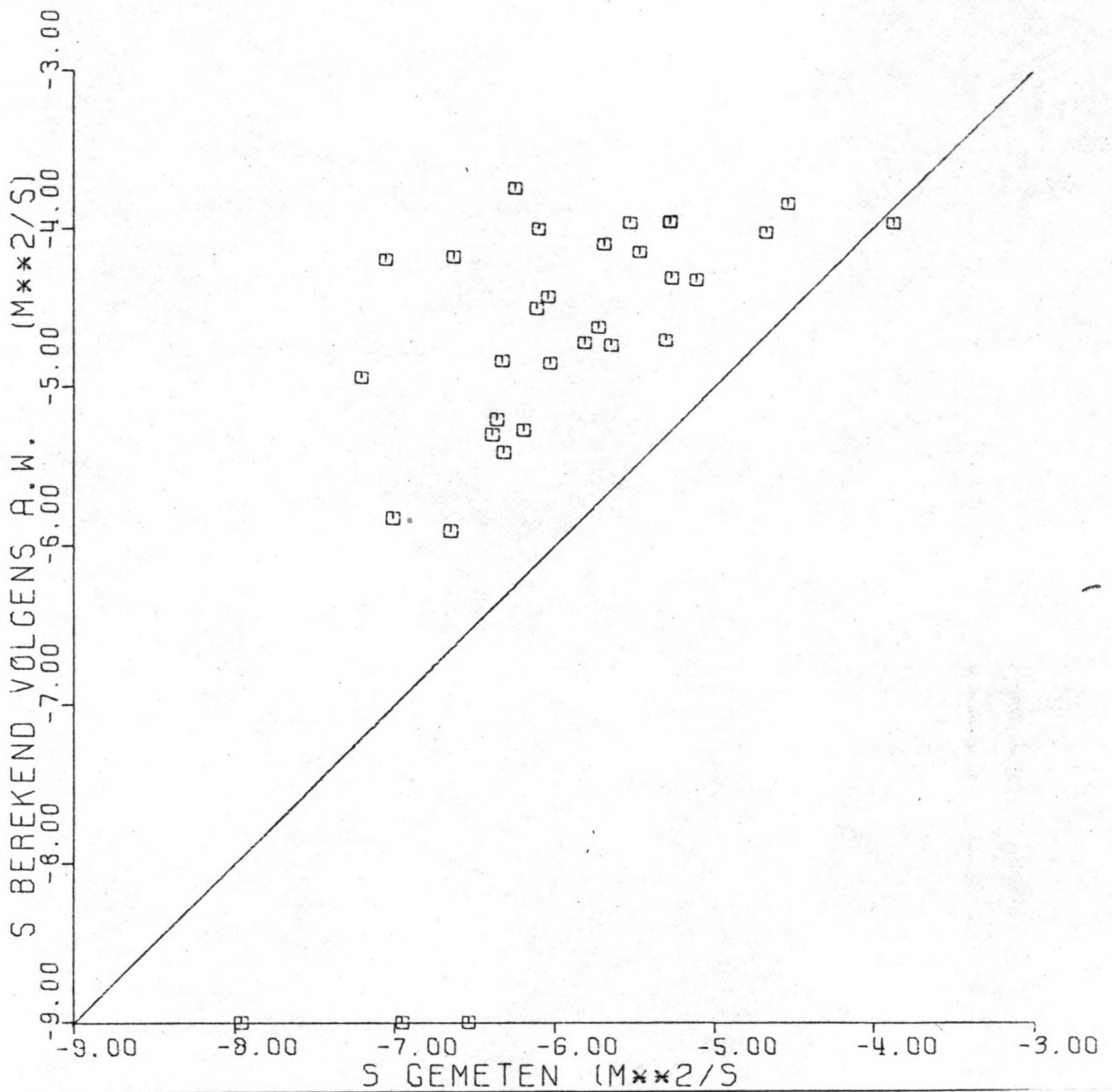
Correlatie-coëfficiënt : 0,17
 Regressielijn : $s_{\text{ber.}} = 0,91 \cdot s_{\text{gemeten}}$
 Gemiddelde van $s_{\text{ber.}}/s_{\text{gemeten}}$: 67,2
 Aantal metingen : 29

Fig. 6.10 Metingen van de IJssel en het Pannerdens kanaal,
 vergelijking gemeten en berekende transport volgens
 de 3^e modificatie van M.P.M.



Correlatie-coëfficiënt : 0,76
 Regressielijn : $s_{\text{ber.}} = 4,70 \cdot s_{\text{gemeten}}$
 Gemiddelde van $s_{\text{ber.}}/s_{\text{gemeten}}$: 252
 Aantal metingen : 31

Fig 6.11 Metingen van de IJsel en het Pannerdens kanaal,
 vergelijking gemeten en berekende transport volgens Rottner.



Correlatie-coëfficiënt : 0,33
 Regressielijn : $s_{\text{ber.}} = 1,24 \cdot s_{\text{gemeten}}$
 Gemiddelde van $s_{\text{ber.}}/s_{\text{gemeten}}$: 70,3
 Aantal metingen : 29

Fig 6.12 Metingen van de IJssel en het Panterdensch kanaal,
 vergelijking gemeten en berekende transport volgens A.W.

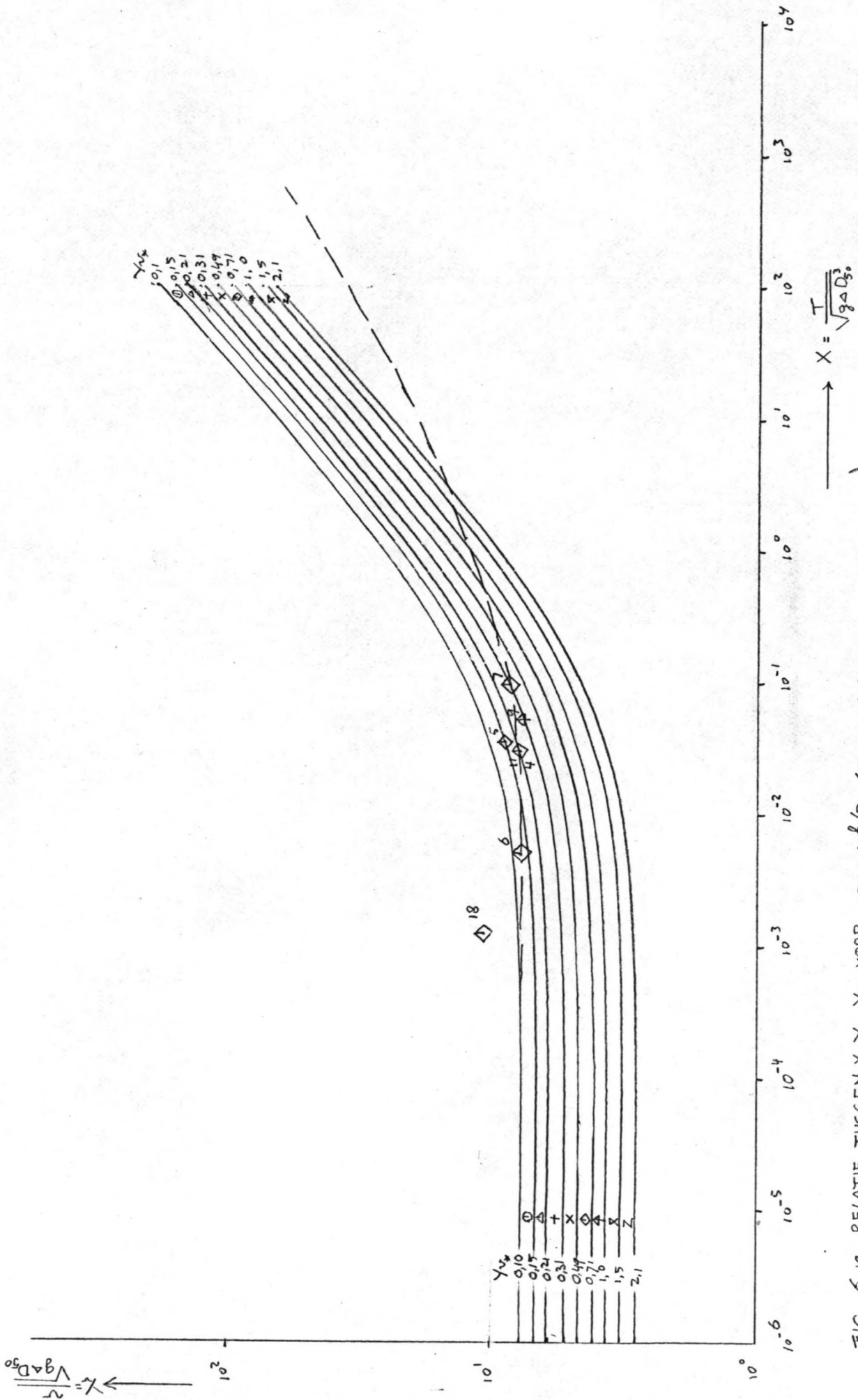


FIG. 6.13 RELATIE TUSSEN $X, Y_0, Y_{0,5}$ VOOR $4900 < L/D_0 \leq 7100$ VOLGENS M.P.M.

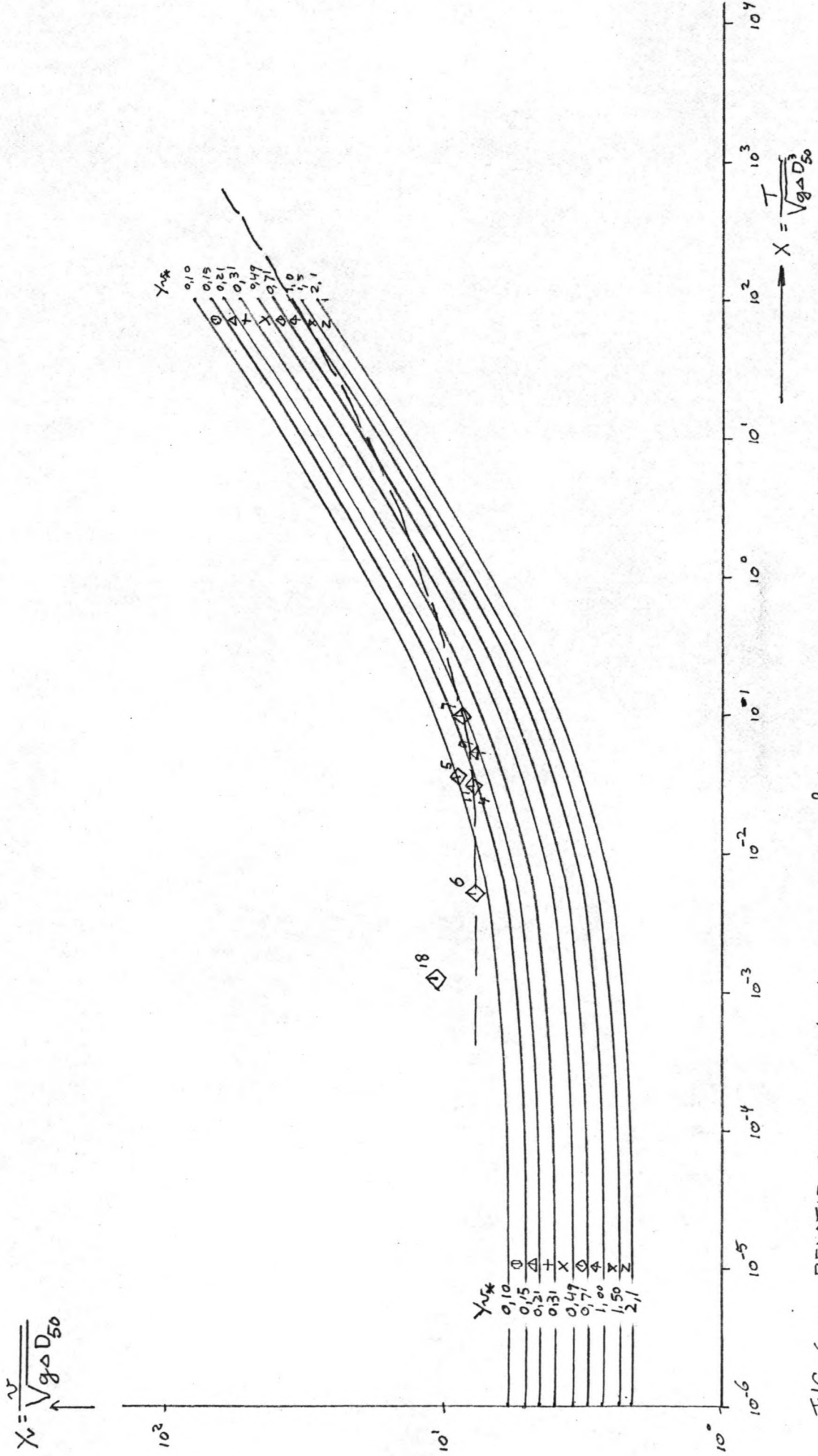


FIG. 6.14 RELATIE TUSSEN $X, Y_{0.4}, Y_{0.8}$ VOOR $4900 < R/D_{90} < 7100$ VOLGENS DE 1^e MODIF. VAN M.P.M.

$$Y_r = \frac{v}{\sqrt{g \Delta D_{50}}}$$

$$\diamond \quad 0,49 < Y_{r*} \leq 0,71$$

$$\square \quad 0,71 < Y_{r*} \leq 1,0$$

• PLAATS VAN MEETPUNT ALS
X BEREKEND WORDT MET DE
3^e MODIF. VAN M.P.M.

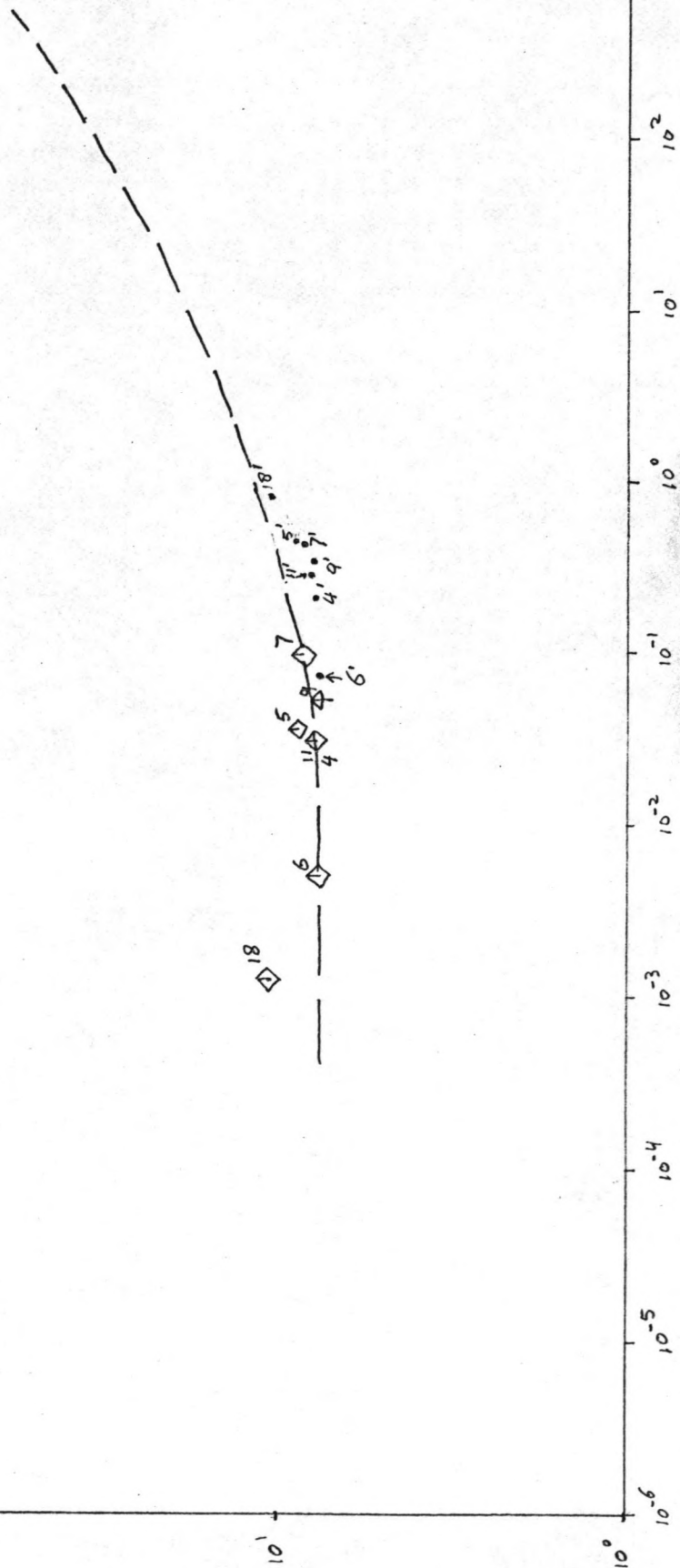


FIG. 6.15 RELATIE TUSSEN X, Y_r EN Y_{r*} VOOR $4900 < h/D_{90} < 7100$ VOLGENS DE 3^e MODIF. VAN M.P.M.

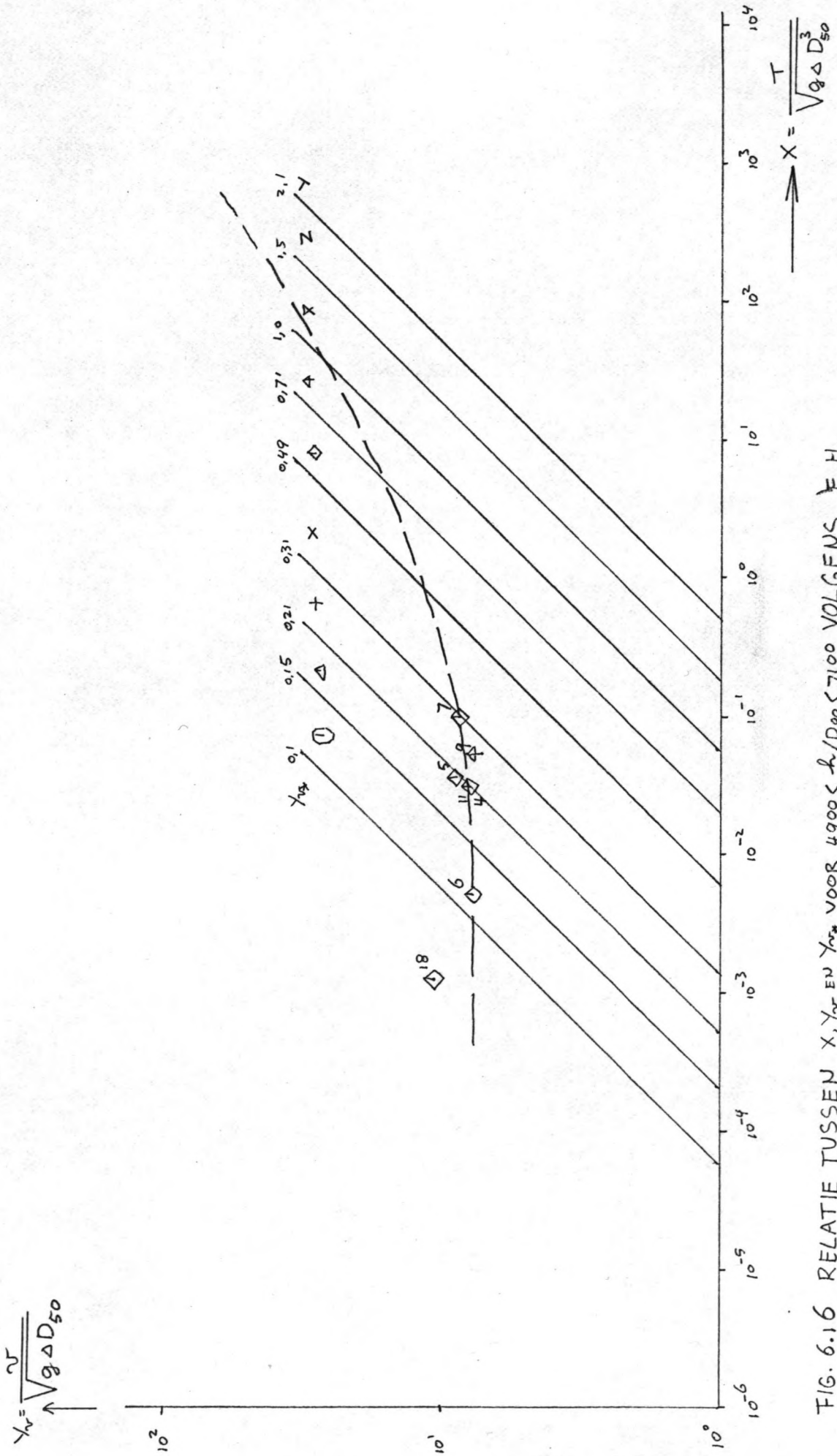


FIG. 6.16 RELATIE TUSSEN X, Y_r EN Y_{rs} VOOR $4900 < h/D_{90} < 7100$ VOLGENS E.H.

$$Y_r = \frac{\tilde{v}}{\sqrt{g \Delta D_{50}}}$$

10² 10¹ 10⁰

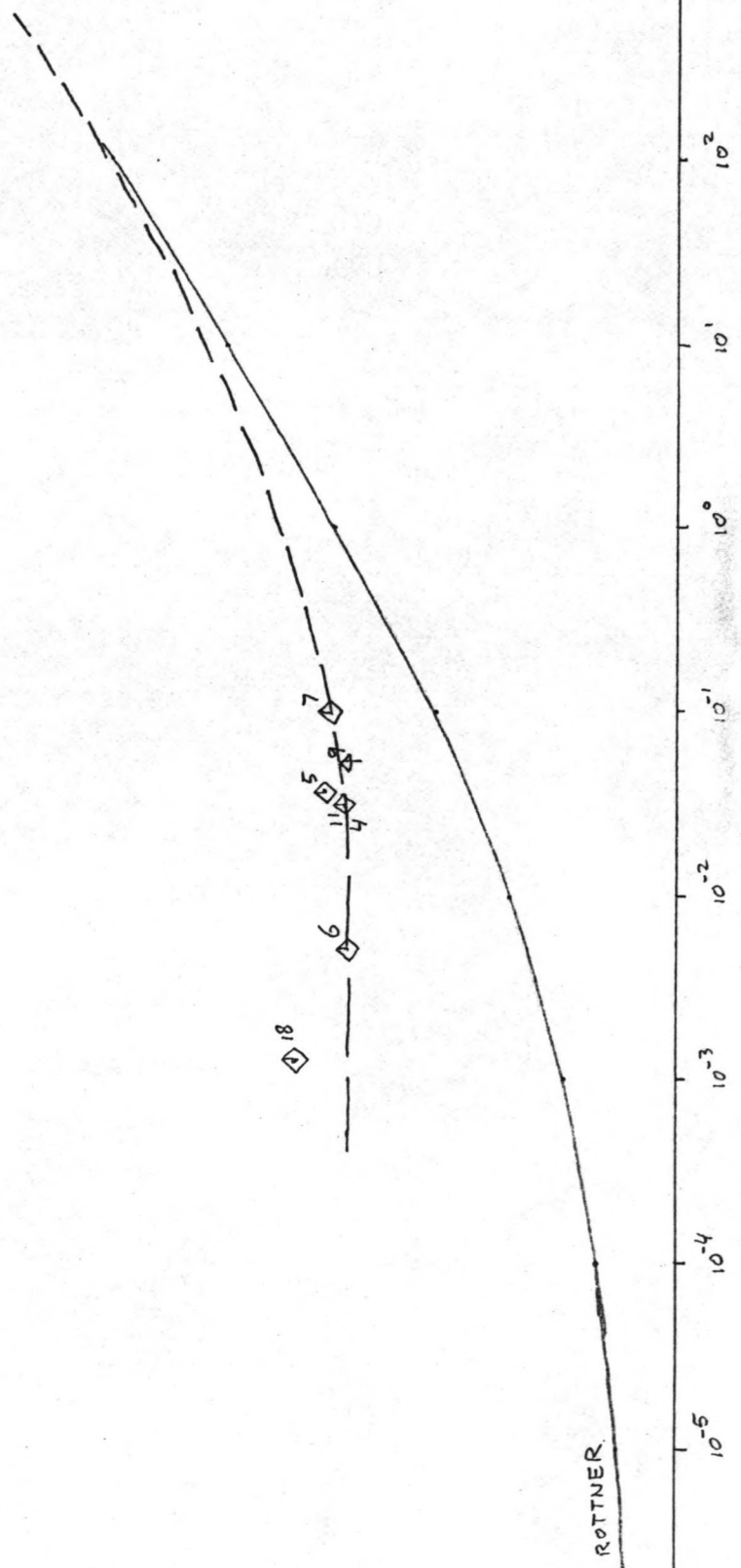


FIG. 6.17 RELATIE TUSSEN X , Y_r EN Y_{rx} VOOR $4900 < k/D_{90} \leq 7100$ VOLGENS ROTTNER

$$Y_0 = \frac{v}{\sqrt{g \Delta D_{50}}}$$

$$\diamond 0,49 < Y_{*} \leq 0,71$$

$$\square 0,71 < Y_{*} \leq 1,0$$

• PLAATS VAN MEETPUNT
ALS X BEREKEND WORDT
MET A.W. NUMMERING.
MET ACCENT

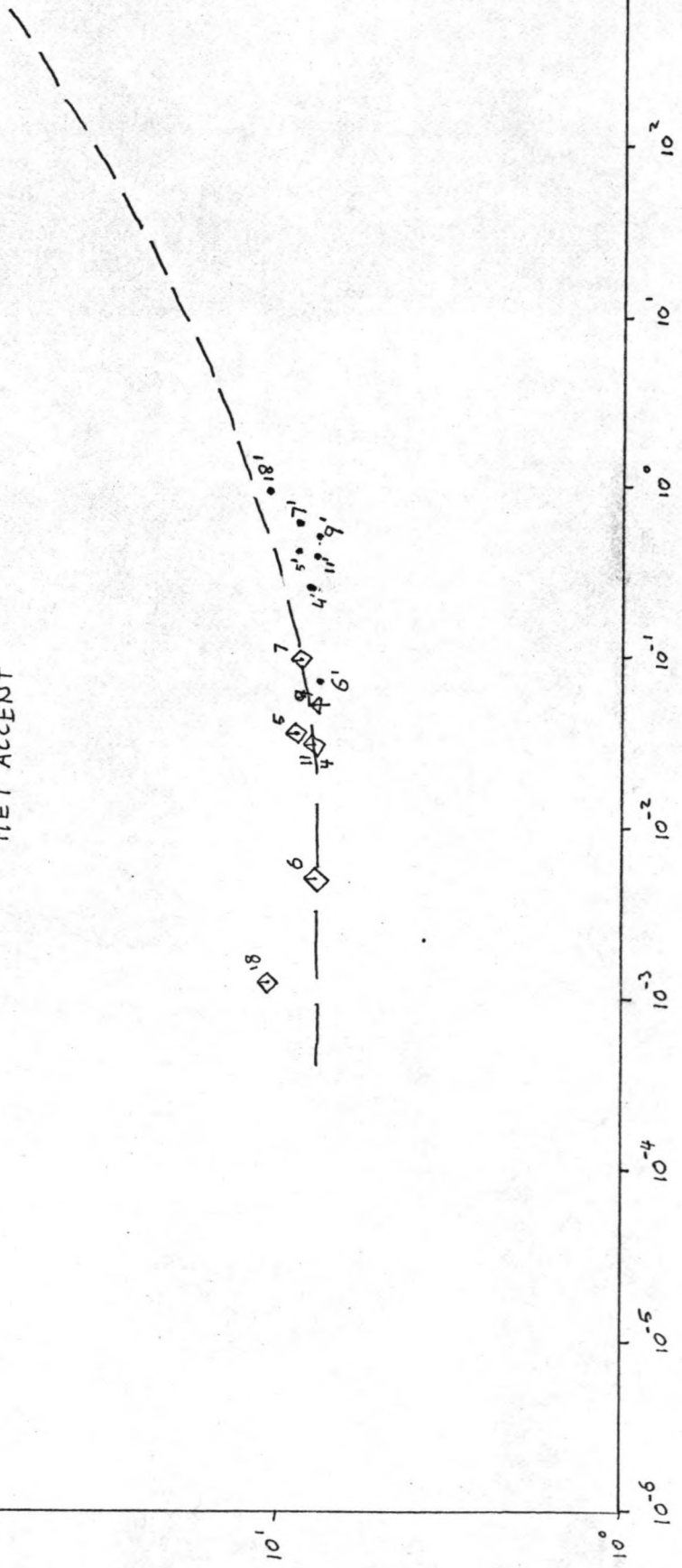


FIG. 6.18 RELATIE TUSSEN X, Y_0 EN Y_{*} VOOR $4900 < h/D_{90} \leq 7100$ VOLGENS A.W.

