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Open Data Project: Flight Data Analysis of Kitepower Systems

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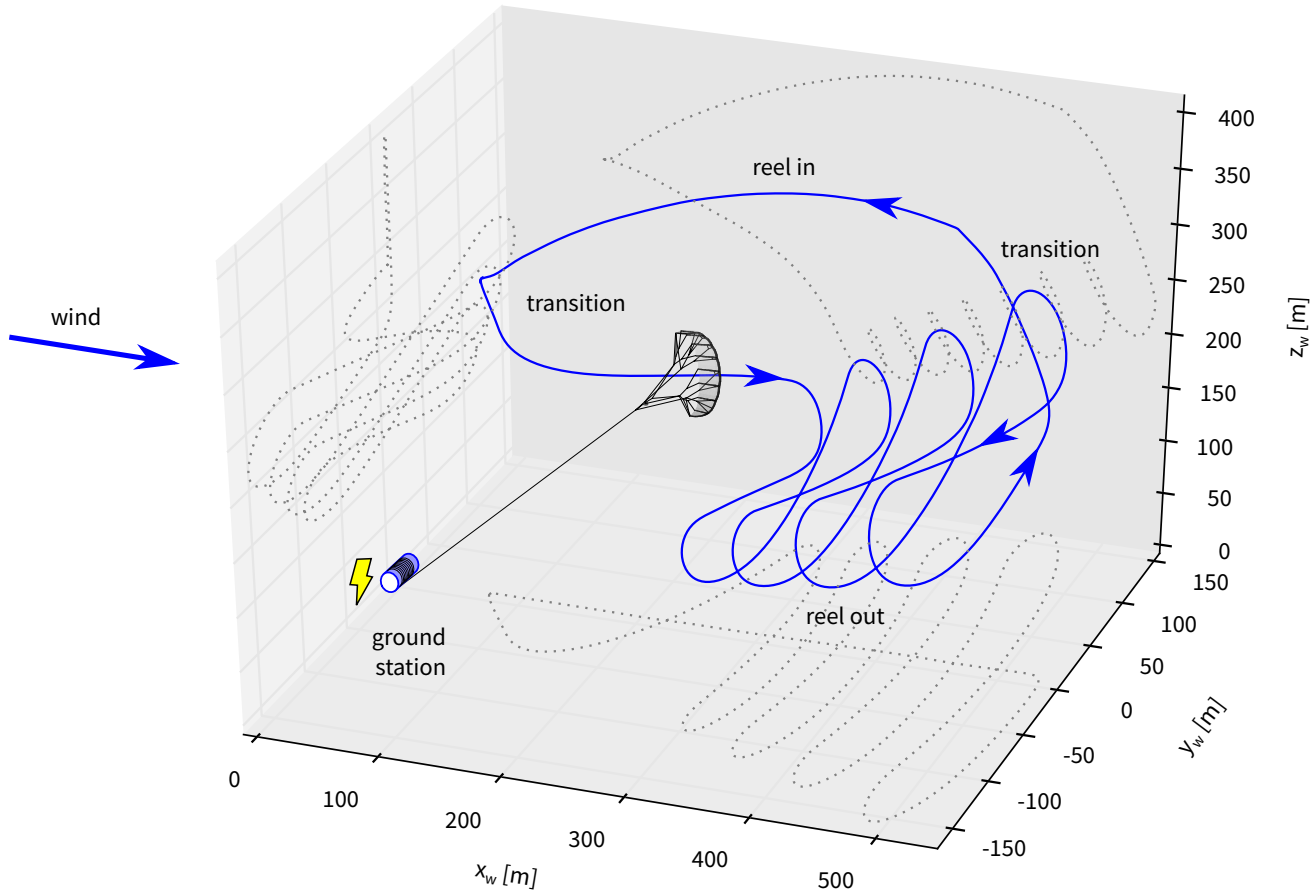
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Flight path of the TU Delft pumping kite power system computed with a dynamic system model (kite not to scale), from Fechner, U.: *A Methodology for the Design of Kite-Power Control Systems*. PhD thesis, Delft University of Technology (2016). <http://doi.org/10.4233/uuid:85efaf4c-9dce-4111-bc91-7171b9da4b77>





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Open Data Project: Flight Data Analysis of Kitepower Systems

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Due to support from the Data Refinement Fund from “4TU.ResearchData” we are able to publish a large data set with logged flight data from 42 flights in the years 2011 to 2015 [1]. These flights were executed by the Kitepower research group of Delft University of Technology.

In total 81 different physical values and control signals where logged during the flights, though in most cases not all values were logged at each flight.

The logged data is provided as .hdf5 file. From this file for each flight the data can be exported as CSV file (comma separated values), a format compatible with nearly any programming environment. Alternatively the archives with the CSV files can be downloaded directly.

Furthermore Python scripts are provided for extracting meta data, filtering the data and also for plotting. Basic examples how to use the data are also provided in the programming languages Julia and Matlab.

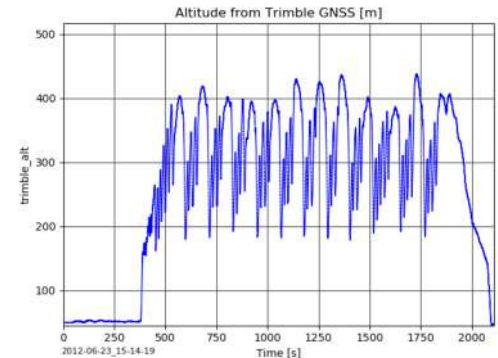
While some of the data was already published before [2] for the first time the complete data of 42 flights is provided.

We present an overview of the metadata such as the test location, kites, sensors and the data fields. Then, an overview and some explanations about the flight data are given. Finally, the use of the Python scripts and the use of the data with other programming languages is explained.

As a highlight the performance of different types of autopilots are shown.

This data set can serve as source for further analysis of

kite power systems based on flexible wings for MSc students and PhD researchers.



Plot of the height of the kite during a test flight on 23 June 2012. The max altitude was 438m and the peak mechanical power 20.5 kW at an average wind velocity of 9.5 m/s at 6 m height.

References:

- [1] Schmehl, R., Fechner, R.: Kite power flight data 2011–2015. Delft University of Technology (2019). <https://doi.org/10.4121/uuid:5e1fda11-9ae1-4c0a-ab31-4a2c04f70740>
- [2] Oehler, J.; Schmehl, R.; Peschel, J.; Faggiani, P.; Buchholz, B. (2018): Kite power flight data acquired on 24 March 2017. 4TU.Centre for Research Data. Dataset. <https://doi.org/10.4121/uuid:37264fde-2344-4af2-860c-efda9caa3e8>