Motivation

Power generating kites have the potential to generate clean energy at a low cost competitive with coal power plants or cheaper without subsidies (see e.g. [1, 2, 3] and references therein). “Drag power” kites generate power with onboard wind turbines and generators by flying fast crosswind motions, see Fig. 1. Electrical power is transmitted to the ground at a medium voltage level via electric cables in the tether.

Tasks, Suggested Solution Approach, Expected Results

The airspeed, angle of attack, and angle of sideslip of the kite must be available at all times with high accuracy for feedback control. In this student work, different air data acquisition strategies
are to be investigated and tested with our kite prototype. To be tested concepts include pitot tubes, wind vanes, ultra sonic sensors, mechanical sensors, as well as software sensors. The considerations should include high reliability in bad weather as well as sensor failures. The key result of this work is a working air data sensing system. This multidisciplinary task is supported by the members of the kiteKRAFT team.

**Starting Point**

This announcement, the literature list below, and additionally provided internal documents upon start.

**Report and Presentation Guidelines**

One report (or thesis) and at least one presentation of the results are required. Guidelines and templates can be downloaded from [https://github.com/floba/StudentGuidelines](https://github.com/floba/StudentGuidelines).

**Your Profile**

This student work will be jointly supervised by the Institute for Electrical Drive Systems and Power Electronics and the TUM startup kiteKRAFT. The ideal candidate

- is a student in electrical engineering, mechanical engineering, mechatronics, aeronautics, or related fields,
- has good skills/background knowledge in electronics, micro controllers, aerodynamics, MATLAB, Office, LaTeX,
- is motivated in the respective field of science and engineering,
- has good English and German language skills.

**References**

