

Interactive comment on “Aerodynamic characterization of a soft kite by in situ flow measurement” by Johannes Oehler and Roland Schmehl

Johannes Oehler and Roland Schmehl

j.d.oehler@tudelft.nl

Received and published: 3 September 2018

The main reasons for not using phase averaging were that both authors are not familiar with this method and that the observed fluctuations were not given a very high priority since they were seen rather as misbehavior of the system. The oscillations at $f = 1.2$ Hz did not occur during the whole flight but only at several occasions for intervals of about 10 seconds. The amplitude always stayed below 2 degrees for the angle of attack and 1 m/s for the flow velocity. Figure 10 shows the most pronounced oscillation of this kind. Since those fluctuations are caused by a bad response of the ground station and do not occur in a systematic way we did not focus on this phenomenon. The variations

C1

that both flight speed and angle of attack undergo while the kite performs its pumping cycles show a much larger amplitude. Since we did not have experience in applying phase averaging and the oscillation is more regarded as an unwanted anomaly we decided for a simple “moving average” filter.

When looking at the repeated scheme of controlled figures of eight or entire pumping cycles there might be a different picture. One cycle takes about 2-3 minutes and one figure of eight about 40 seconds. If phase averaging could help to fuse the data of different cycles or different figures of eight into useful information and increase statistical relevance it would be a great tool. In our case we had a quite limited number of only 10 different pumping cycles which also showed large variations in flight path, power setting and wind speeds.

A more detailed explanation of the oscillation modes of the kite can be found in http://awec2017.com/images/posters/Poster_Oehler.pdf which is also referred to in the paper.

Interactive comment on Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2018-46>, 2018.

C2