Anonymous Referee #2

The topic is definitively unique and the work you have done is remarkable. Nevertheless, the paper does need some work to be considered for a final publication. I would therefore, urge you to consider the following point for an improvement:

1. There are some language issues I have. Sometimes sentences are hard to read, not easy to understand or repeat certain words (like “and”) very often. Also always keep articles in mind: It is “The” kite system on line 14 on page 1. Please also check line 8-9 on page 2. Line 10 (ending) on page 2. The “ands” in line 19-20 and the sentences around it on page 2. “The thing that” on line 8 on page3. “The” average system model on line 13 same page. “Another thing” in line 20 page 3 – which thing? . . . so please reread the text critically concerning the language and expression!

The paper had been revised and a lot of modifications were added based on the reviewer comments.

2. Page 2: Where does the wind energy density range from . . . ? Is this globally?? Please cite a source!

This part is rewritten in detail in page. 3 lines (11-20) as following:

AWE systems can capture more energy with higher capacities, which is why they are considered a good renewable energy system. The wind energy density at an altitude of 10 km could reach up to 5000 W/m2 according to Wubbo Ockels, the developer of the "ladder-mill" concept in 1997Ockels(2001). However, it is too hard to build a system that can operate at an altitude of 10 km and generate electricity from wind. This is why most of the current development and research projects have shifted their focus to lower altitudesArcher et al.(2014).
Wind energy density ranges from 1400 to 4500 W/m2 at altitudes of 200 to 900 m, respectively. Wind turbines cannot be installed at these altitudes because of the limitations of tower sizeGoudarzi et al.(2014). Therefore, it will be an optimum solution to have a system similar to wind turbines at this altitude but with no tower. The concept of wind turbine blade rotary motion can be replaced by a tethered kite connected via the flexible wing to a fixed generator on the ground.

3. Page 3 Paragraph lines 14-19, please rephrase a bit and watch the language. It should be formal.

This part is modified to be formal (page 4, lines: 15 – 18) as following:

Experimental efforts for the autonomous take-off of the airborne systems were carried out, however there are still some challenges to get fully autonomous flight in different wind conditions. Moreover, a global controller that can work under all conditions cannot be designed effectively for the commercial products Fechner and Schmehl(2012);Jehle and Schmehl(2014a);Baayen and Ockels (2012).

4. Page 3 in the paragraph afterwards: How can a technique be promising, if it is only valid for a non-realistic case?

The technique is promising in the theoretical simulations to optimize flight trajectory, but in a real flight test, it will require accurate and fast wind data that are currently unavailable (due to restrictions of hardware). Thus, in the future, it is expected to obtain these data so fast and accurate to be used in the real-time flight tests.

5. Page 3 and further: What is a classical controller? Is this defined somewhere?

New section is added (2 Mathematical model); it gives a lot of details to explain the mathematical model and the classic control.

6. Define all magnitudes used in the equations in the text! All! Otherwise the rest gets seriously unclear.

All magnitudes used in the equations are added in the beginning of the paper under the section of (Nomenclature)

7. Page 5 line 11 you mention, that you minimize Jk. How? Where this is mathematically described?

The section of (3 System Identification Using Least Square Estimation) is written in detail and it was modified to be clearer to the reader.

8. In the section 3, please make sure, you cite every source you have been using properly.

More references are added in the section.

9. Equation (17), why did you use these magnitudes? How did you get them?

This part was added in section 4, as given in page 16 lines (8) to page 17 lines (5):

In our case, the range of the error e is -5 to 5 rad, as shown in Eq. (30)[3]. The last step ….. Choosing 3 sets satisfies the stability requirements.

10. Section 3.3, please refer to some source for further reading. Remember: It is science. This means everything you have been done, needs to be possibly redone by others to check for validity. This should be possible after reading your paper and all the sources you cited.

Two sources are added in this subsection (4.3 Defuzzification):

This is the last stage of the fuzzy logic control. It is the process of converting the set of inferred fuzzy signals chosen from the fuzzy output, as mentioned in the rule base4.2, into the non-fuzzy (crisp) control actionDeif et al.;Burns(2001), as shown in Fig.8b. The most known defuzzification technique is the center of area method. In this case, the control action can be easily obtained by calculating the sum of the first moments of the area divided by the sum of the area. The Matlab fuzzy toolbox is used to simplify the work and save programming time.

11. In figures 4, 5, 6, 7, 11, 12: What are the magnitudes on the y-axis? Where is this explained?

All the magnitudes are added in the nomenclatures section; the new numbering for them becomes Fig. 8,9, and 12. The y-axes for figures 9, and 12 are non-dimensional, and figure 8 has a symbol of μ , it was added on the figure; it was a mistake to not write it in the first draft.

12. On page 11 line 2 you mention classical (?) and fuzzy control in the figures. But it doesn't say in the caption of the figures, which is which.

The caption for the classical control and fuzzy control are modified in figures 10 and 13. The difference between the fuzzy and classic controllers are shown as a subfigures for the same figure.

13. Page 11 line 6: More shaper does not exist.

The shape of the wind speed was replaced from the triangle shape to be smoother with changing in the frequencies; it is explained in details (page 18 line 3-5) as following:

(The difference between the two flight conditions is the wind speed. The wind speed is modelled as shown in Figs.11band14b. The difference between the two models is that the frequency of the wind in14bis much higher than that in11b. Gaussian noise was added to the sensor data (elevation, azimuth, and apparent wind speed).)

14. Why is in figures 8,9, 14, 15 the path given in degrees? Please give a reason in the text.

The physical meaning of those figures are mentioned in section (2 Mathematical model). Therefore the reason of using degree was explained in detail.

15. On page 14 line 5 you mention for the first time "hardware in the loop". What do you mean by this now – as you mention it the first time.

The meaning of the Hardware of the loop is explained in page 15 lines (13-16) as following:

The computations of fuzzy control were calculated as hardware-in-the-loop (HIL) Bondoky et al.(2017). This means that sensors sent data to the ground station using wireless communications. Then, the calculations were performed using computers on the ground based on the results of the system identification algorithm to choose the suitable control action. Finally, the control action was sent again to the motor to steer the kite.