Interactive comment on "From lidar scans to roughness maps for wind resource modeling in forested areas" *by* Rogier Floors et al.

Rogier Floors et al.

rofl@dtu.dk

Received and published: 24 April 2018

1   Reponse Reviewer 1

The paper presents different ways of taking surface roughness and tree height into account when using WASP. I think it's an interesting paper and I recommend that is should be accepted.

We thank the reviewer for the comments and have made modifications accordingly (see below). The line numbers all refer to the track-changed manuscript where deletions are indicated in red and new text is indicated in blue.

Some detailed comments are given below.

Printer-friendly version

Discussion paper

- p. 2, line 20 Reads driven by lines of roughness change lines. Is this correct?

We corrected this to: *"Heterogeneity in roughness is modelled through a roughness change model, which consists of an internal boundary layer model that is driven by lines of roughness changes on a map. The speed-up effects due to changes in terrain height are taken into account by a flow-over-terrain model."*

- p. 7, Table 3 What is the relation between Equivalent Roughness Length (m) and z0 in Eq. 1?

The word "equivalent" was confusing here, because the roughness length in this table are simply assigned to the map before applying it in the model chain as described in lines 9–19 on page 11. We therefore changed "Equivalent" to "Prescribed". Eq. 1 is not specifically used in WAsP and to be more explicit we added a reference to the vertical profile equations (page 11, line 10).

- p. 3, line 3, typo It reads height was used, therefore, the displacement

We replaced "therefore" with "and".

- p. 8, bottom, typo It reads testing the different as the

We corrected this sentence to: *"This makes the site ideal for testing the different maps, because the meteorological masts are impacted by both changes in tree height and forest edges."*

- p. 9, line 15, typo It reads had their roughness was set to 0.1 m

C2

We removed the word "was" in this sentence.

- p. 9, below eq. 2 It reads the forest height was used to calculate a zero-plane displacement height d. I don't understand. Why is the displacement height related to the tree height?

The displacement height is often related the vegetation height. This is a widely used assumption and for further details we refer to, for example, Garratt (1992).

Please also note the supplement to this comment:
https://www.wind-energ-sci-discuss.net/wes-2018-10/wes-2018-10-AC1-supplement.pdf

Interactive comment on Wind Energ. Sci. Discuss., https://doi.org/10.5194/wes-2018-10, 2018.