Wind Energ. Sci. Discuss.,
https://doi.org/10.5194/wes-2020-13-RC2, 2020

Open Access
WIND ENERGY SCIENCE DISCUSSIONS

Interactive comment on "Ability of the e-TellTale sensor to detect flow features over wind turbine blades: flow stall/reattachment dynamics" *by* Antoine Soulier et al.

Anonymous Referee #2

Received and published: 29 July 2020

General Remarks: Overall an interesting study, comparing the ETell-Tale derived data with PIV, and employing 3 analytical methods to detect stall and reattachment on a pitching airfoil from PIV data. The authors show interesting insights, but a few points need revision, particularly the phrasing, the notation and details of the experimental and analytical procedures. There are also more than a few typos.

I also note I already read reviewer 1's comments, so I will not repeat them.

Specifically:

Title: ' On the ability of the e-TellTale sensor for the detection of flow stall and reattachment dynamics'

You are thinking about wind turbines, but the measurements are for a straight foil section at small Re. So the present title is a bit misleading, I think. Also, the use of / should be avoided, specially in the title

l11-create>creates l15- smartblade>smart blades l21 - 2007 is not so recent of a reference... l37 - static variations ? l47 - wake width>foil wake (i.e. not the turbine wake)

Fig 2 - show detail of the geometry of the ETellTale sensor, namely the 'pink part'

l68 - what is the mean AOA during the pitching motion ?

Fig 3 - I miss the reference frame

Fig 4 - Rather unclear figure - I miss the reference frame and sx,sy ticks - subfigure a) appears to show a separated flow condition, whereas b) appears attached; is this inconsistently labeled in the caption, or is it because of the camera perspective ? - is 'sy' vertical or along the span ?

l118 - default>a non-identification l120 - So, you corrected the data-points for which the detection algorithm did not work, and set sxc to 1, and these correspond to the blue points in fig 5 ? Why ? It appears the unidentifiifed data-points occur when the flow is attached. According to fig 5, wouldnt it make sense to 'correct' these data-points to around sxc=0.75 ?

Fig 5 - show y axis variable

Fig 6 - Show airfoil contour

eq (1) - This formula and its application is not so clear ? Use subscripts ? Is ˆthe cross product ? I guess P is a point with coordinates (x,y) and not a vector, and so we cannot define the cross product.

l171 - brutal > massive l184 - you show a characteristic frequency, not the associated time-step

Fig 7 - the a-i points were chosen based solely on visual inspection ? Of how many instantaneous snapshots ? It might explain why you found a consistent lag wrt the analytical stall and reattachment detection methods

Figs 8 & 9 - Show foil contour - use large colorbar font

l207 -you only know the method is robust after you used it...

Fig 11 - larger colorbar font - Remark a2 and a3 are nearly complementary in terms of phase, which is indicative of a succesfull POD

Fig 12 - Use reference "Norberg, C., Fluctuating lift on a circular cylinder: review and new measurements. Journal of Fluids and Structures, 17, pp. 57−96, 2003" To explain slightly higher St for your Re

Fig 15 - what do c=21 and c=9 mean ? mention in the caption - also in the caption >super- imposed

l262 - is this 'dispersion' associated with turbulent structures in shear layers ? Please be specific

l287 - futher>further

l305 - famous DS vortex> Leading edge vortex associated with dynamic stall

Fig 19 - Remark Psi 2 has a much smaller energy content

l313 - since it appears all stall detection methods are early wrt the visual reference, does it make sense to adjust the visual reference ?

Tables 1 & 2 - Use more concise column titles !!

l336 - Ability of the e-TellTale sensor to detect flow stall

Fig 23 - the fluctuations on the 'brut' signal appear to be of the same frequency as the sampling you are showing. . . and some of these higher frequencies are still seen with a moving average e=9.

Do you know what is the natural frequency of the tell-tale sensor ? This might have a crucial influence, and MUST be considered, for both laboratory and field experiment design

l363 - trailing edge > in the aft region

Interactive comment on Wind Energ. Sci. Discuss., https://doi.org/10.5194/wes-2020-13, 2020.