Abstract Submitted
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Advanced Fluid Research On Drag reduction In Turbulence Experiments – AFRODITE[1] JENS H.M. FRANSSON, Linne Flow Centre, KTH Mechanics — A hot topic in today's debate on global warming is drag reduction in aeronautics. The most beneficial concept for drag reduction is to maintain the major portion of the airfoil laminar. Estimations show that the potential drag reduction can be as much as 15%, which would give a significant reduction of NOx and CO emissions in the atmosphere considering that the number of aircraft take offs, only in the EU, is over 19 million per year. In previous tuned wind tunnel measurements it has been shown that roughness elements can be used to sensibly delay transition to turbulence[2]. The result is revolutionary, since the common belief has been that surface roughness causes earlier transition and in turn increases the drag, and is a proof of concept of the passive control method per se. The beauty with a passive control technique is that no external energy has to be added to the flow system in order to perform the control, instead one uses the existing energy in the flow. Within the research programme AFRODITE, funded by ERC, we will take this passive control method to the next level by making it twofold, more persistent and more robust.

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[2]Fransson et al. 2006 *Phys. Rev. Lett.* **96**, 064501.

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