Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Transition delay by means of base flow modulations[1] S.S. SATTARZADEH, S. SHAHINFAR, B.E. FALLENIUS, J.H.M. FRANSSON, A. TALAMELLI, Linne Flow Centre, KTH Mechanics — Recent experimental investigations have shown that spanwise modulations of the base flow may delay transition to turbulence.[2] In this study we explore the possibility to generate streaks of much larger amplitude than previously reported by using a row of miniature vortex generators (MVGs). Here, we present the first boundary layer experiment where streak amplitudes exceeding 30% have been produced without having any secondary instability acting on them. Furthermore, the induced skin-friction drag due to the streaky base flow is quantified and it is demonstrated that the streaks can be reinforced by placing a second array of MVGs downstream of the first one. In this way it is possible to make the control more persistent in the downstream direction. We conclude that the specially designed set of MVGs, as a boundary layer modulator, is a promising candidate for successfully setting up robust and persistent streamwise streaks, which is a prerequisite for a successful flow control. This work is carried out within the AFRODITE programme funded by ERC.

[1]Financial support from the European Research Council (ERC) is acknowledged.
[2]Fransson et al. 2006 *Phys. Rev. Lett.* **96**, 064501.

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Date submitted: 01 Aug 2011 Electronic form version 1.4