Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Low-Dimensional Modal Description of Optimal Streaks MARIA HIGUERA, ETSI Aeronauticos. UPM, JOSE MANUEL VEGA, ETSI. Aeronauticos. UPM — Streaky perturbations play an essential role in the destabilization of boundary layers, especially in the presence of free-stream turbulence. These perturbations are calculated in terms of a streamwise evolving parabolic problem. Using the asymptotic behaviour of the solutions near the leading edge singularity, we obtain a low-dimensional modal description of the streaks in the case of a boundary layer attached to a flat plate. Comparison with optimal streaks obtained via the adjoint gradient (Luchini, JFM 2000), seems to indicate that the development of the instability may be understood on the basis of appropriate amplitude equations giving the streamwise evolution of the amplitudes of the relevant modes.

Maria Higuera
ETSI Aeronauticos. UPM

Date submitted: 05 Aug 2008 Electronic form version 1.4