

Abstract Submitted  
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**Generation of boundary-layer disturbances by freestream forcing** KAREN KUDAR, PETER CARPENTER, University of Warwick, CHRISTOPHER DAVIES, Cardiff University, UNIVERSITY OF WARWICK COLLABORATION, CARDIFF UNIVERSITY COLLABORATION — We present an investigation based on simplified DNS of the generation of boundary layer disturbances by free-stream vorticity in Falkner-Skan boundary layers. The free-stream vorticity is generated by a source of the form  $\delta(x)\delta(z - z_f)\exp(i\beta y)$  derived from a body force, where  $(x, y, z)$  are the streamwise, spanwise and wall-normal co-ordinates,  $z_f$  is located above the boundary layer and near its edge, and  $\beta$  is the spanwise wave-number. Both streamwise and spanwise vorticity and stationary and oscillating sources are used. A steady streamwise vorticity source creates a diffused and corrugated sheet of streamwise vorticity that drives the boundary layer with a wall-normal velocity, thereby generating streak-like structures within the boundary layer. Oscillating the source acts to generate two different structures; one similar to a Klebanoff mode and the other, depending on the frequency of oscillation, either grows exponentially or decays and cannot be seen.

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