Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

**Aerodynamics of yacht sails: viscous flow features and surface pressure distributions** IGNAZIO MARIA VIOLA, Univ of Edinburgh — The present paper presents the first Detached Eddy Simulation (DES) on a yacht sails. Wind tunnel experiments on a 1:15th model-scale sailing yacht with an asymmetric spinnaker (fore sail) and a mainsails (aft sail) were modelled using several time and grid resolutions. Also the Reynolds-average Navier-Stokes (RANS) equations were solved for comparison with DES. The computed forces and surface pressure distributions were compared with those measured with both flexible and rigid sails in the wind tunnel and good agreement was found. For the first time it was possible to recognise the coherent and steady nature of the leading edge vortex that develops on the leeward side of the asymmetric spinnaker and which significantly contributes to the overall drive force. The leading edge vortex increases in diameter from the foot to the head of the sail, where it becomes the tip vortex and convects downstream in the direction of the far field velocity. The tip vortex from the head of the mainsail rolls around the one of the spinnaker. The spanwise twist of the spinnaker leads to a mid-span helicoidal vortex, which has never been reported by previous authors, with an horizontal axis and rotating in the same direction of the tip vortex.

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Date submitted: 04 Aug 2014 Electronic form version 1.4