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Characterization of the low-frequency unsteadines in LES data of supersonic and hypersonic STBLI CLARA HELM, PINO MARTIN, University of Maryland — In a recent study, Priebe *et al.* (JFM 2016) used Dynamic Mode Decomposition (DMD) to analyze DNS data of a Mach 3 ramp-generated shock and turbulent boundary layer interaction (STBLI). The authors found that the reconstructed low-frequency DMD modes took on the form of Görtler-like vortices downstream of separation. The five reconstructed modes reproduced the low-frequency dynamics of the separation bubble accurately. Martín *et al.* (AIAA2016-3341) and Martín *et al.* (APS, DFD 2016) show that the low-frequency unsteadiness in STBLI results from an inviscid centrifugal instability similar to that found in separated subsonic and laminar flows, and that the turbulence is modulated but passive to the global mode. In this work we further characterize the Görtler-like vortices using LES data of Mach 3 and Mach 7 separated STBLIs. We find that the Görtler-like vortices are unsteady, and we quantify the wavelength, amplitude and the aperiodic development of these structures. This work is supported by the Air Force Office of Scientific Research under grant AF9550-15-1-0284.

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