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**Low-frequency unsteadiness in a shock wave boundary layer interaction**[1] RIO BAIDYA, SVEN SCHARNOWSKI, MATTHEW BROSS, CHRISTIAN J. KÄHLER, Bundeswehr University Munich — Large field-of-view (FoV) particle image velocimetry experiments are conducted in the vicinity of a shock wave boundary layer interaction (SWBLI) at Mach 2. The current FoV covers up to 30 boundary layer thicknesses, comprising of upstream and downstream regions relative to the SWBLI, thereby allowing the turbulent boundary layer and shock to be simultaneously captured. The relationship between the boundary layer features and the instantaneous shock location is directly quantified, with the aim of better understanding the mechanisms responsible for oscillation of the reflected shock. Simultaneous wall-pressure measurements indicate that the low-frequency fluctuation arising from the oscillating shock foot is not necessarily an independent phenomenon from the turbulent features entering the SWBLI region and interact with the shock. Instead, a large scale separation between their dominant time-scales is due to dampening of high-frequency content beyond the critical frequency of the globally unstable mode occurring at frequencies that are orders of magnitudes slower than the dominant frequency of the very-large-scale velocity features.

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