Abstract Submitted
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Compressible turbulence properties in a shock wave boundary layer interaction[1] JEAN-PAUL DUSSAUGE, SEBASTIEN PIPONNIAU, PIERRE DUPONT, IUSTI/CNRS/Univ. Aix-Marseille, SUPERSONIC GROUP TEAM — Shock induced separations are known to develop unsteadiness. Recently, a simple model was proposed to relate this unsteadiness to the dynamics of the mixing layer formed downstream of the separation shock. Such layers are known to be sensitive to compressibility. We will present turbulence measurements in the case of a Mach 2.3 shock reflection, performed by 2-component PIV. Turbulent data accuracy is tested in the upstream boundary layer, where no significant compressibility effects are expected on velocity fluctuations. The same turbulent data are shown in the interaction, where compressibility effects are likely. Results will be compared with data obtained in plane compressible mixing layers and in subsonic separated flows. It will be shown that, despite curvature effects and proximity of the wall, very similar behaviors are observed in the case of shock reflection. The main effect of compressibility is found to modify turbulence anisotropy, through a drastic reduction of vertical fluctuations, as in compressible mixing layers.

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