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**Shock jumps in shock-turbulence interactions in the presence of very strong turbulence fluctuations**[1] CHANG-HSIN CHEN, DIEGO DONZIS, Texas AM Univ — Shock-turbulence interactions are ubiquitous in nature and engineering and have, thus, been studied extensively with simulations and experiments. With the continuous increase of computational power available, investigations have considered an increasingly wide range of conditions in terms of the strength of turbulence and shock waves. One consistent observation in the literature is the departure from Rankine-Hugoniot relations due to turbulent fluctuations upstream of the shock. Based on the so-called quasi-equilibrium assumption, analytical solutions for thermodynamic jumps that take into account the observed "holes" in the shock are presented and compared to new DNS data using shock-resolving simulations. By considering the effect of subsonic regions upstream of the shock, the good agreement obtained in previous work is extended to the broken regime at $M_t/\Delta M > 2$. Based on these results we also present refined analytical solutions on the dilatation at the shock. This is discussed in the context of shock structure and the conditions for shock destruction by turbulence. An extended study of how changes experienced by turbulence can be characterized by the flow and thermodynamic conditions will also be discussed.

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