

Abstract Submitted
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Interaction of shocklets and vortex surfaces in high-Mach-number Taylor-Green flows¹ NAIFU PENG, YUE YANG, Peking Univ — We simulate the evolution of vortex-surface fields (VSFs) in viscous compressible Taylor-Green flows with a range of Mach numbers (Ma), and quantitatively investigate the interaction of shocklets and vortex surfaces in the temporal evolution. Here the isosurface of the VSF is defined as a vortex surface consisting of vortex lines. In high- Ma flows, shocklets are generated and they have strong interaction with vortex surfaces. Before vortex reconnection, the shocklets with strong contracting velocity significantly shrink the surrounding vortex surfaces, and on the other hand they are slightly curved by the vortex-induced velocity. Subsequently the shocklets cause the earlier occurrence and larger degree of vortex reconnection with increasing Ma .

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