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NUMERICAL SIMULATION OF A SHOCK ACCELERATED HEAVY GAS CYLINDER

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ABSTRACT

A detailed numerical simulation of a shock accelerated heavy gas (SF_6) cylinder surrounded by air gas is presented. From the snapshots of the time evolution of the gas cylinder, we find that the evolution of the shock accelerated gas cylinder is in some ways similar to the roll-ups of a vortex sheet for both roll up into a spiral. The systemic and meaningful analyses of the negative circulation, the center of vorticity and the vortex spacing are in a good agreement with results obtained from the prediction of vorticity dynamics. Unlike the mixing zone width in single-mode or multi-mode Richtmyer-Meshkov instability which doesn't exist a single power law of time owing to the bubble and spike fronts follow a power law of t^{θ} with different power exponents θ, the normalized length of the shock accelerated gas cylinder follows a single power law with $\theta = 0.43$ obtained from the numerical results.