# A TWO DIMENSIONAL COMPUTATION OF RIBBED PIPE FLOW

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The study of ribbed pipe flow is currently of great interest to several diverse groups ups. Unlike smooth pipe flow which has been studied in great depth, ribbed pipe flow is relatively new to experimental, analytic
and computational research efforts. A recent computer simulation of ribbed pipe flow was made by the Air Force Weapons Laboratory using a two-dimensional, Eulerian, finite difference hydrodynamic computer code. Two separate experiments were. modeled using a course (.13cm x .78cm) and a very fine (.065cm x .065cm) zone calculation. The two-dimensional calculations used one-dimensional input, obtained from a highly successful earlier effort to model smooth pipe flow. The one-dimensional input closely matched the smooth tube calibration performed prior to the ribbed pipe experiment.

Computational flow patterns and pressure waveforms were compared to pictures of holographs of the experimental flow and also to pressure waveforms obtained from the various gauges. Individual shocks and vortices could be matched very well as the pressure waveforms.