# OPTIMIZING DIFFRACTION PHASE COMPUTATIONS BY LINKING A 1D CODE WITH A 2D CODE

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Air blast shock wave diffraction computations in the vicinity of a target are usually computer-time consuming. Even in 2D situations, improvement of the mesh resolution may lead to significant computer-time consumption.

Now, in many instances, i.e. the majority of shock tube flow calculations, only the vicinity of the target requires to set up a 2D or occasionally 3D meshing. In the present paper, only 2D situations are considered. The cost of computation may then be reduced, whereas the quality of the computation is preserved or even increased if the 2D code is linked to a 1D or quasi 1D code.

Implementation of this method has been verified with the finite difference codes PISCES-1D (Lagrangian code) and HULL-BLAST-2D (Eulerian code). All required modifications had been made to both codes and, in addition, a specific link-routine has been written. The code have been run in sequence to solve the flow inside a shock tube.

In order to validate this method, its results has been compared to 2 others: first, the PISCES code alone and then the HULL code alone. The results of the 3 methods are in good agreement. The comparison
cost/capabilities of the 3 methods shows clearly a significant advantage for the linked PISCES-HULL method.