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ADVANCES IN (SHOCK) FITTING METHODS

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ABSTRACT

When shock-capturing schemes are used to model shock waves and their interaction the discretization errors generated along the captured shock wave can severely degrade the fidelity of the flow simulation within the entire shock-downstream region. These limitations are rooted in some of the fundamental ingredients of shock-capturing, and in particular the existence of intermediate shock points, representing a mere numerical artifact, and in general unrelated to the true internal structure of the shock-wave. Shock-fitting (or front-tracking) algorithms allow to overcome these limitations. Their use on structured grids, which still nowadays find their way in compressible DNS, are either limited to simple flow configurations, or require ad-hoc differencing formulae in the vicinity of the fitted shock. The so-called floating shock-fitting is a more versatile approach, but becomes algorithmically very complex when high-order schemes are used. The last 10 years have seen the emergence of unstructured shock fitting methods which allow to overcome some of these limitations greatly enlarging the domain of applicability of fitting methods in complex geometrical configurations, both in two and three dimensions. The objective of this mini-symposium is to bring together some of the contributors to the latest developments in fitting techniques. We are interested in works dealing with all aspects of this method, going form the detection and tracking of the shocks, to the meshing/re-meshing phases, to the coupling with high and very high order CFD methods, and to all new ideas that allow to extend the application of this method.