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Unconfined Cone Tests using Shock-fitting CHRISTOPHER ROMICK, Eureka Physics, TARIQ ASLAM, Los Alamos National Laboratory — There is a prevailing utilization of shock-capturing schemes which can be problematic in regions near discontinuities. The inherent viscosity in these methods gives rise to a smooth shock; however, this comes at the expense of thickening the shock and yields ambiguity in actual shock state. Furthermore, shock-capturing also suffers from an order of accuracy reduction due to the shock. With the use of shock-fitting, both the explicit shock state and order of accuracy of the scheme can be recovered. These methods separate the ambient upstream and smooth reactive flow behind the front and explicitly enforces the jump conditions at the boundary. However, these methods typically suffer from two main drawbacks : 1) secondary unfitted shocks interacting with fitted surfaces and 2) the restriction to very simple geometries, e. g. rectangular charges or right circular cylindrical charges. The first issue is addressed by adding a switch lowering the local order of the algorithm near the fitted shock when a secondary discontinuity is present. In order to further extend the shock-fitting method to more complex geometries, it is modified to allow for the width of the charge to vary with time. This allows for the examination of axisymmetrical cone tests in high-explosive (HE) geometries.

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