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Experimental Method to Determine the Detonation Characteristics of Very Non-Ideal High Explosives GERARD BAUDIN, CHRISTIAN LE GALLIC, PASCAL BOUINOT, DGA/DET/Centre d'Etudes de Gramat — Common experimental configurations used to determine HE detonation velocity-curvature are right circular cylinders detonated in air. The steadily propagating detonation front is curved and its velocity depends upon the diameter of the cylinder. This configuration requires several experiments with different diameters and sufficiently long cylinders to assume a steadily propagating detonation front. This last hypothesis is practically not achieved for non-ideal HE using reasonably long cylinders. To elude this problem, a special explosive device called “logosphere,” developed by CEA, has been adapted to non ideal HE. It provides a well define spherically diverging detonation wave and allows measurements of the detonation velocity-curvature relationship by means of piezoelectric pins without any perturbation. VISAR and DLI diagnostics record the material velocities at the rear surface of HE through transparent windows. The particle velocity values are used to determine the curved detonation states using the detonation velocity-acceleration-curvature model of Louis Brun.

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