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Experiments and numerical simulations of plate gap model for high energetic materials SHIRO KUBOTA, TEI SABURI, YUJI OGATA, YUJI WADA, National Institute of Advanced Industrial Science and Technology, KUNIHITO NAGAYAMA, Kyushu University — The experimental system for this study consists of the pellet explosives and PMMA rings, PMMA pipe and booster explosive part. The pellets and the rings were alternately stacked in the PMMA pipe to make the system. The diameter of the pellet was 20 mm and the thicknesses were 10 or 5 mm. The thickness of the ring was varied to adjust the size of the air gaps between the pellets. The upper three pellet explosives were directly stacked without air gaps, and between the second and the third pellet, PVDF gauge was embedded to measure the arrival time of the detonation. The lower side pellet was put on the cylindrical stand made by PMMA, and the PVDF gauge was inserted between the pellet and PMMA to measure the arrival time of the detonation. Using the arrival times and a distance between two gauges, the average detonation velocity was estimated. The relationship between the size of the air gaps and detonation velocity was investigated. By changing both the gap size and the pellet, we consider that the system can roughly model the initial state of high energetic materials for qualitatively understanding of the initial state dependency. The detonation propagation processes in this system were simulated by our developed numerical code.

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