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Numerical simulation of detonation propagation in PETN at arbitrary initial density by simple model SHIRO KUBOTA, National Institute of Advanced Industrial Science and Technology, TEI SABURI, YUJI OGATA, KUNIHITO NAGAYAMA, Kyushu University — Since the detonation velocity and pressure are dependent to the initial density of high explosive, the parameters of the equation of state (EOS) is dependent to the initial density. In general, the parameter set for each initial density has to be obtained to compute detonation phenomena. For simulation of arbitrary initial densities cases, we try to construct new simulation procedure which only employs the information of theoretical maximum density (TMD). The well known linear relationship between detonation velocity and initial density for high explosive has been employed for this study. Two types of simulation were carried out. The Gruneisen parameter as function of specific volume was calculated by solving the ordinary differential equation, and was employed as unified form EOS to simulate detonation phenomena. To obtain the information of the EOS for arbitrary initial density, the simulation of another type was executed. The calculation field is filled with the particle for TMD and the air, and the density of the high explosive is adjusted. It is investigated whether the velocity of detonation for an arbitrary density can be reproduced only by information on TMD.

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