Abstract Submitted
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The Dynamic Behaviors of Single Crystal RDX Under Ramp Wave Loading to 15GPa GUIJI WANG, JINTAO CAI, JIANHENG ZHAO, FENG ZHAO, GANG WU, FULI TAN, CHENGWEI SUN, institude of fluid physics — Based on high pulsed power generator CQ-4, the single crystal RDX explosive was researched along different crystal orientations under ramp wave loadings up to 15 GPa. The typical three-wave structures were obtained by means of laser interferometry PDV, which show the elastic-plastic transition and α to γ phase transition. The ramp elastic limit (REL) and yield strength of RDX along 210 and 100 crystal orientations were respectively calculated and the resuts show obvious effects of crystal orientaions for RDX. The ramp elastic limit σ_{IEL} of RDX along 210 orientation is 0.688-0.758GPa, and the σ_{IEL} of RDX along 100 is 1.039 -1.110 GPa. The α to γ phase transformation characteristics were also analyzed based on the experimental data. The initial phase transition pressure for the two crystal orientation of RDX are about 3.5 to 4 GPa, which agree well with the data of about 4-5GPa given by MD simulation. The data directly validate the results given by Raman Spectrum under shock compression and static high pressure, which couldn't be observed by wave profiles. The experimental data can be used to verify and validate the new models of RDX under dynamic loading. Supported by NSFC of China under contract No.11327803 and 11176002

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