

Abstract Submitted  
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**Measurement of the delayed failure in the shock compressed AOW rock** HONGLIANG HE, Laboratory for Shock Wave and Detonation Physics Research, Institute of Fluid Physics, P.O.Box 919-102, Mianyang 621900, P. R. China, DENGPING CHEN, College of Science, Wuhan University of Technology, Wuhan 430070, P. R. China, FUQIAN JING, Laboratory for Shock Wave and Detonation Physics Research, Institute of Fluid Physics, P.O.Box 919-102, Mianyang 621900, P. R. China — The failure property of AOW (Amphibolized Olivine Websterite) rock has been studied by measuring the velocity histories on the rear surface of the specimens at stresses much below the Hugoniot elastic limit. A delayed failure zone has been detected. It expands into the stressed material with a velocity comparable to the shock wave front, and follows the propagation of the shock wave with a time delay that decreases with the increasing of shock stress. The time delay is 1.2 microsecond at shock stress of about 0.9 GPa and 0.5 microsecond at about 3.7 GPa. A physical explanation considering the in situ activation and growth of the pre-existing microcracks by the local shear stress under shock compression is proposed for these observations. The results provided a new insight into the dynamic fracture of inhomogeneous brittle materials under the shock wave loadings.

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