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Principal Hugonuot and decaying shock Hugoniot on silicates TOSHIMORI SEKINE, Center for High Pressure Science and Technology Advanced Research, NORIMASA OZAKI, RYOSUKE KODAMA, Osaka University, YUHEI UNEDA, TOMOKO SATO, Hiroshima University, KOHEI MIYANISHI, TOYOHITO NISHIKAWA, Osaka University, TOSHIMORI SEKINE COLLABORATION, NORIMASA OZAKI COLLABORATION — Laser shock experiments can achieve warm dense matter conditions applicable to the formation of planets and interior of large planets. The techniques of velocity interferometer system for ant reflector (VISAR) and streaked optical pyrometer (SOP) are used to observe the laser-shocked materials above ˜200 GPa, where the shock fronts in most materials become effective reflectors. The VISAR and SOP profiles give shock velocity and temperature directly if the shock structure is one-wave. In the measurement of principal Hugoniot we need one more parameter such as particle velocity that will be determined in a simultaneous measurement of a reference by the impedance match method. In decaying shock measurements, shock velocity and temperature of a sample are monitored simultaneously and pressure will be read using the principal Hugonot relation available as known experimentally or predicted. If two-wave structures appear at phase transition, the analyses are complicated. Therefore we must be careful in applying the decaying shock data to planetary problems. I summarize them by comparing the difference between the principal and decaying Hugoniots of silicates. Sekine et al. (2016) Sci. Adv. 2, e1600157.

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