

**SOFTENING OF THE HUGONIOT AND ANOMALOUS
OPTICAL EMISSION FROM SHOCK FRONT IN SILICON
AT 200-500 GPa**

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Single-crystal Silicon was shock-compressed by means of traditional and Mach-type explosive generators. Its shock Hugoniot was determined by impedance matching with Quartz reference. Data, obtained at 280-510 GPa, demonstrates significantly soft Hugoniot, in comparison with data of Pavlovsky at 80-196 GPa, although consistent with semiempirical EOS of Bushman and Lomonosov, and with QMD calculation of Hu and Militzer. The optical emission from shock front was registered by 4-channel near-infrared pyrometer (transparency window of Si: 1.3, 1.5, 1.6, 1.8 μm bands), and the brightness temperature of shock-compressed silicon was calculated. The experimental brightness temperature, measured in the pressure range 70-510 GPa, demonstrates the strong disagreement (2-5 times lower) with available EOS predictions. The reason of the observed difference is discussed.