High pressure optical properties of sodium AMY LAZICKI, ALEXANDER GONCHAROV, VIKTOR STRUZHKIN, ZHENXIAN LIU, Carnegie Institution of Washington, EUGENE GREGORYANZ, CHRISTOPHE GUILLAUME, University of Edinburgh, HO-KWANG MAO, RUSSEL HEMLEY, Carnegie Institution of Washington — Sodium displays significant complexity at high pressure. The melting temperature drops above a critical pressure, nearly reaching ambient temperature by 120 GPa. In the same pressure regime, phase transitions to low-symmetry and incommensurate structures are observed. Computational studies predict a decrease in the metallic character, and experimental observations have indicated this as well. We present infrared reflectivity for Na through the high pressure incommensurate phase, revealing a significant drop near 120 GPa. First principles calculations of the optical properties are compared to values derived from a Kramer’s Kronig analysis of the experimental IR reflectivity, revealing the detailed nature of the pressure-induced deviations from simple metallic behavior.

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