Laboratory Tests of Stellar Interior Opacity Models


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The internal structure of stars depends on the radiative opacity of the stellar matter. Opacity models, however, have never been directly validated by experiments at stellar interior conditions. X-ray transmission measurements of iron, an important stellar constituent, are underway at the Sandia Z facility at temperature and density high enough to evaluate the physical underpinnings of stellar opacity models. Initial experiments provided information on the charge state distribution and energy level structure of iron ions expected to exist at the solar radiation/convection boundary. Data analysis and new experiments at higher densities and temperatures will be described.

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