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Experimental design to measure oxygen opacity at high density and temperature PAUL KEITER, University of Michigan, S. TURCK-CHIEZE, CEA, J. COLGAN, LANL, J.-E. DUCRET, CELIA, Universite de Bordeaux, C. J. FONTES, J. A. GUZIK, D. P. KILCREASE, LANL, M. LA PENNEC, CEA, R. C. MANCINI, University of Nevada - Reno, K. MUSSACK, LANL, C. ORBAN, Ohio State University, T. S. PERRY, LANL, P. L. POOLE, LLNL, MATT TRANTHAM, University of Michigan — In recent years, there has been a debate over the abundances of heavy elements (Z >2) in the solar interior. Recent solar atmosphere models [Asplund 2009] find a significantly lower abundance for C, N, and O compared to models used roughly a decade ago. This discrepancy has led to an investigation of opacities through laboratory experiments and improved opacity models for many of the larger contributors to the sun's opacity, including iron and oxygen. Recent opacity measurements of iron disagree with opacity model predictions [Bailey et al, 2015]. Although these results are still controversial, repeated scrutiny of the experiment and data has not produced a conclusive reason for the discrepancy. New models have been implemented in the ATOMIC opacity code for C, O and Fe to address the solar abundance issue [Colgan, 2013]. Armstrong et al [2014] have also implemented changes in the ATOMIC code for low-Z elements. However, no data currently exists to test the low-Z material models in the regime relevant to the solar convection zone. We present an experimental design using the opacity platform developed at the National Ignition Facility to study the oxygen opacity at densities and temperatures near the solar convection zone conditions.
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