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Photonuclear and radiative capture reaction rates for Nuclear Astrophysics MARY BEARD, S. FRAUENDORF, University of Notre Dame, B KAEMPFER, Institut fuer Strahlenphysik, Helmholtz-Zentrum Dresden-Rossendorf & Institut fuer Theoretische Physik, Technische Universitat Dresden, R. SCWENGNER, Institut fuer Strahlenphysik, Helmholtz-Zentrum Dresden-Rossendorf, M. WIESCHER, University of Notre Dame — The vast majority of nuclei heavier than iron are synthesisized via the capture of neutrons. There are however 35 naturally occurring nuclei, including isotopes of Mo and La, located on the neutron-deficient size of the valley of stability. It has been proposed that these nuclei, referred to as p-nuclei, are produced via sequential photo-dissociation reactions in the oxygen-neon shell burning regions of a pre-supernova star. As such, cross sections for p-nuclei production are particularly sensitive to the gamma-ray strength function, which, though dominated by the giant dipole resonance, may contain extra strength contributions near to the neutron threshold. Recently new (γ, γ') cross section measurements have been performed at the ELBE facility at Helmholtz-Zentrum Dresden-Rossendorf for the nuclei $^{92-100}$Mo, ^{88}Sr, ^{90}Zr and ^{139}La probing the photo-absorption cross section over an energy range 4.5 - 6 MeV, up to the neutron separation threshold. The use of these measurements as a test of existing gamma-ray strength function models, and the consequent impact on p-nuclei production rates, will be discussed.

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