Super Metal-Rich Pre-White Dwarfs as High-Precision Atomic-Physics Laboratories

Alexander Landstorfer

Institute for Astronomy and Astrophysics, Eberhard Karls Universität Tübingen, Sand 1, 72076 Tübingen, Germany

EC 11481–2303, Feige 110, and PG 0909+276 are pre-white dwarf stars that have been shown to exhibit extreme iron-group element (Ca − Ni) overabundances. With very high resolution and high signal-to-noise ratio spectra of the space telescope imaging spectrograph, detailed spectral analyses could be performed. Modeled and observed line strengths were then compared for more than 450 isolated absorption lines, which gave the opportunity to evaluate the quality of existing atomic data of certain iron-group element ions. Considering the uncertainty of the analysis and evaluation procedure, an upper limit for the uncertainty of the underlying atomic data was established. Then, strong, reliable isolated absorption lines were found, which are recommended to use as reference points for abundance determinations in similar objects.