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## Benchmark of the $2p$ line formation in OVII near the collisional excitation threshold

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Emission lines from He-like ions are an essential diagnostics tool of high-resolution X-ray spectra from satellite missions, such as Chandra and XMM-Newton. Due to the simplest close-shell structure of these ions, observable spectra contains the strongest and easiest identifiable emission lines in a variety of astrophysical objects. The physical insight of these lines can be used to probe the dynamics of hot coronal plasmas, cool photo-ionized plasmas, as well as out-of-equilibrium-plasmas like ones present in the winds of X-ray binaries, and supernova remnants. Recently, the Perseus cluster's X-ray spectrum was analyzed using Hitomi's Soft X-ray Spectrometer micro-calorimeter to measure turbulent motion at its center. The broadening and Doppler shift of He-like lines of FeXXVIII was used in this regard. However, obstacles emerged in the analysis due to inaccuracies in atomic data employed in standard plasma modelling codes. This motivates not only a careful analysis of the theoretical methods, but also an experimental benchmark of the line formation mechanisms.

X-ray measurements of He-like OVII were carried out at the FLASH-Electron Beam Ion Trap (EBIT), Heidelberg. The decay of the forbidden $z$ line population was directly observed with an electron beam energy scheme defined by a triangular wave. We observed the He-like dielectronic recombination (DR) KLn structure, as well as resonant excitations (RE) superimposed to collisional excitations (CE) of H-like and He-like ions at the collisional excitation threshold. The $2p$ line emission ($x + y + w$) was isolated with a sufficient fast scan that makes the $z$ emission constant, allowing its subtraction from the overall emission. The experimental method was verified with a home-made collisional-radiative code. Results of the line formation are compared with calculations of FAC, based on isolated-resonant approximation, and R-matrix method, as well as current state-of-the art R-matrix calculations.

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