



Contribution ID: 33

Type: **Short oral in replacement of poster**

## **Short\_Oral\_33: Verification of Ni ion dielectronic satellite structure in JET plasma diagnostic for low and high plasma rotation**

*Wednesday, 8 September 2021 17:10 (10 minutes)*

Measurement of the x-ray spectra of the He-like Ni ions ( $\text{Ni}^{26+}$ ) and their dielectronic satellites ( $\text{Ni}^{25+}$ ,  $\text{Ni}^{24+}$ , and  $\text{Ni}^{23+}$ ) plays a crucial role in determination of electronic and ionic temperature of plasma in the JET device. Because  $n \geq 3$  satellites of  $\text{Ni}^{25+}$  overlap with resonance 'w' line of  $\text{Ni}^{26+}$ , it is important to reconstruct the structure of these satellites reliably. It is especially important in the cases when plasma rotation is high what results in additional shift of  $n \geq 3$  satellites of  $\text{Ni}^{25+}$  in respect to resonance 'w' line.

Collisional-Radiative Modelling (CRM) by using the FAC code has been used for modeling the spectral emission from  $\text{Ni}^{26+}$  + dielectronic satellite ions from plasmas for various electronic temperatures. Multi-Configurational Dirac-Hartree-Fock + Configuration Interaction (MCDHF-CI) calculations by using the GRASP code has been used to examining electron correlation effect on wavelengths and transition rates for  $L \rightarrow K$  transitions occurs in He- and Li-like Ni ions. Basing on ab initio calculations we were searching for optimal approach to fit the  $n \geq 3$  satellites of  $\text{Ni}^{25+}$  in experimental JET spectra.

**Primary authors:** KOZIOŁ, Karol (National Centre for Nuclear Research); RZADKIEWICZ, Jacek (National Centre for Nuclear Research); PATEL, Ashwin (Culham Centre for Fusion Energy)

**Presenters:** KOZIOŁ, Karol (National Centre for Nuclear Research); RZADKIEWICZ, Jacek (National Centre for Nuclear Research)