

## Progress of atomic data and collisional-radiative modeling in KAERI

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We have implemented unitary correction [1] for relativistic distorted wave (RDW) approximation of electron-impact excitation (EIE) in the original flexible atomic code. The EIE cross sections for Ar and Ar<sup>+</sup> are calculated by the unitarized RDW code and compared with others by more sophisticated *R*-Matrix calculation and experiments (Ar), and other DW calculation (Ar<sup>+</sup>).

A collisional-radiative (CR) modeling for low temperature He plasma was developed, which solves nonlinear steady-state balance equations including radiation trapping and heavy particle collisional ionization [2]. The electron temperature and density diagnostics by the CR modeling and optical emission spectroscopy was compared with Langmuir probe measurements.

A novel applied-field MagnetoPlasmaDynamic (AF-MPD) thruster device simulating particle and heat fluxes in divertor for plasma surface interaction (PSI) study has been constructed in KAERI and the performances have been measured [3,4]. A CR modeling for H plasma to determine the plasma parameters is under developing. Our results about the EIE and the CR modeling will be uploaded on our web site <https://pearl.kaeri.re.kr> in the near future.

### References

- [1] D.-H. Kwon and Y.-S. Cho, Atomic Data and Nuclear Data Tables **137** (2021) 101385
- [2] K.-B. Chai and D.-H. Kwon, Spectrochimica Acta Part B: Atomic Spectroscopy **183** (2021) 106269
- [3] K.-B. Chai and D.-H. Kwon, Plasma Physics and Controlled Fusion **62** (2020) 035007; K.-B. Chai, D.-H. Kwon, and M. Lee, Plasma Physics and Controlled Fusion *in revision process*

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