

# **Spectroscopic study of EUV and SXR transitions of Be-like ions with plasma parameters**

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## **ABSTRACT**

In the present work, the spectroscopic study of atomic parameters of Os LXXIII, Ir LXXIV, Pt LXXV and Au LXXVI are examined and diagnosed in an extensive and detailed manner by adopting GRASP2K package based on fully relativistic Multi-Configuration Dirac-Hartree-Fock (MCDHF) wave-functions. We have presented energy levels of lowest 45 levels and radiative data for electric dipole (E1), electric quadrupole (E2), magnetic dipole (M1) and magnetic quadrupole (M2) transitions within Extreme Ultraviolet (EUV) and Soft X-ray (SXR) range for Os LXXIII, Ir LXXIV, Pt LXXV and Au LXXVI from ground state within lowest 45 levels. We have matched our results with theoretical results available only for few lowest levels and found good agreement with them. We have also discussed discrepancies with them. Further, due to insufficiency of atomic data for higher excited states, we have carried out similar parallel calculation by employing fully relativistic distorted wave flexible atomic code (FAC) to check the reliability and authenticity of higher excited states. Our calculated energy levels match well with our FAC results. Additionally, Characterization of hot dense plasma (HDP) with its parameters temperature, electron density, skin depth, plasma frequency is demonstrated in this work. We believe that our presented data may be beneficial in future for comparisons and identification of spectral lines, in plasma modelling and in fusion and astrophysical plasma research.