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Photoionization and Structure of the Superheavy Atom Og (Z=118): Interchannel Coupling on Steroids REZVAN KHADENHOSSEINI, AHMAD RAZAVI, DAVID KEATING, STEVEN MANSON, Georgia State University, PRANAWA DESHMUKH, IIT-Tirupati — Calculations of the structure and photoionization of the closed-shell superheavy oganesson (Og) atom have been performed using Dirac-Fock (DF) and relativistic-random-phase approximation (RRPA) methods, a study inspired by a recent investigation of the structure of Og [1]. Although Og is in the noble gas column of the periodic, the ordering of near-outer subshells is rather peculiar owing to the strength of relativistic and spin-orbit interactions at such high Z, Specifically, the ordering of the levels is hydrogenic from the 1s up to the 6s subshell. But interlopers are found between the levels of spin-orbit doublets; the ordering of the near-outer subshells is found to be $6p_{1/2}$, $5f_{5/2}$, $5f_{7/2}$, $6p_{3/2}$. Photoionization cross sections and angular distributions have been obtained for each subshell from threshold to almost 2 keV and the results show that interchannel coupling dominates the photoionization process over most of the energy region; the cross sections of the weaker subshells become mini-versions of the stronger cross sections owing to the coupling. Work supported partially by the US DOE and SERB (India). [1] P. Jerabek, et al, Phys. Rev. Lett. **120**, 053001 (2018).

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