Abstract Submitted
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**Extensive computation of allowed and forbidden transition probabilities in the potassium isoelectronic sequence** GOPAL DIXIT, PRANAWA C. DESHMUKH, IIT Madras, STEVEN T. MANSON, Georgia State University, SONJOY MAJUMDER, IIT Madras — Our primary aim in this work is to present both allowed and forbidden transition amplitudes and corresponding wavelengths and oscillator strengths for a few ions in the 19-electron potassium isoelectronic sequence. All of these ions have the configuration [Ar] $3^2D_{3/2}$as their ground state, except in the case of K and $Ca^+$, where it is [Ar] $4^2S_{1/2}$.This difference in ground state configuration arises due to strong contributions of correlation effects in the energy levels of these systems [1]. Allowed and forbidden transitions in these systems are of great importance in astrophysics [2] and in laboratory plasma research [3]. We apply in the present work the relativistic coupled-cluster (RCC) theory [4] to evaluate the energy levels and wave functions of these systems and study amplitudes for electric and magnetic dipole transition amplitudes and also the electric quadrupole transition amplitudes. The contributions of various electron correlation effects to the transition amplitudes are estimated in some detail using the RCC theory. [1] Gopal Dixit et al., Astrophys. J (submitted); arXiv.org: physics/0702066. [2] C. R. Cowley and G. M. Wahlgern, Astronomy & Astrophysics, **447**, 681 (2002). [3] J. E. Vernazza, E. M. Reeves, Astrophys. J. Suppl. **37**, 485 (1978) [4] I. Lindgren, Physics Scripta, **36**, 591 (1987).

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