Abstract Submitted
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Properties of Fr-like Th^{3+} from microwave spectroscopy of high-L Rydberg states of Th^{2+1} JULIE KEELE, CHRIS SMITH, SHANNON WOODS, STEPHEN LUNDEEN, Colorado State University, CHARLES FEHRENBACH, Kansas State University — Spectroscopy of high-L n= 28 Rydberg levels of Th^{2+} was recently reported using the optical RESIS method [1]. Because the ground state of Fr-like Th^{3+} is a $^2F_{5/2}$ level, each (n,L) Rydberg level of Th^{2+} is split into six eigenstates whose relative positions are determined by long-range e-Th^{3+} interactions. Measurements of those positions can be used to determine the Th^{3+} properties that control those interactions, such as polarizabilities and permanent moments. We report a much improved study of n=28 levels with $9 \leq L \leq 12$, obtained with the microwave/RESIS method. The higher precision measurements allow improved determinations of a wider range of Th^{3+} properties and a better test of theoretical calculations [2].

[1] Julie A. Keele, M.E. Hanni, Shannon L. Woods, S.R. Lundeen, and C.W. Fehrenbach, Phys. Rev. A 83, 062501 (2011)
[2] U.I. Safronova, W.R. Johnson, and M.S. Safronova, Phys. Rev. A 74, 042511 (2006)

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