

Abstract Submitted
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Improved Polarizabilities of Th^{4+} from microwave spectroscopy of Th^{3+} Rydberg levels¹ JULIE KEELE, STEPHEN LUNDEEN, Colorado State University, CHARLES FEHRENBACH, Kansas State University — The dipole and quadrupole polarizabilities of Rn-like Th^{4+} were recently measured using the optical Resonant Excitation Stark Ionization Spectroscopy (RESIS) method [1]. With this method, a Doppler-tuned CO_2 laser excites high-L Rydberg levels of Th^{3+} to a much higher Rydberg level that can be detected by Stark ionization, and the polarizabilities are revealed by the fine structure pattern resolved in the laser excitation. Much improved precision can be obtained with the RESIS/Microwave technique [2] in which direct transitions between high-L levels of the same principal quantum number are induced by RF or microwave fields and detected by their effect on the optical RESIS signals. We will report on progress using this technique to improve the determinations of the Th^{4+} polarizabilities.

[1] M.E. Hanni, et. al., Phys. Rev. A 82, 022512 (2010)

[2] M.E. Hanni, et. al., Phys. Rev. A 78, 062510 (2008)

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