Abstract Submitted
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Quantifying the Asymmetry of Giant Resonances in Sc^{3+} Photorecombination and Sc^{2+} Photoionization[1] TOM GORCZYCA, DRAGAN NIKOLIC, Western Michigan University, NIGEL BADNELL, University of Strathclyde — We report on strong interference effects for the asymmetric, broad, and highly-correlated $3p^5 3d^2(^2F^o_J)$ resonances in the photorecombination of Sc^{3+}. Using a perturbative multiconfiguration Breit-Pauli approach, we present theoretical photorecombination cross sections that compare favorably with the Test Storage Ring measurements of Schippers *et al.* [1]. In order to reproduce the observed asymmetric resonance profiles, it was necessary to include resonance-continuum and $3p^5 3d^2$-$3p^5 3d4s$ resonance-resonance interference to the next-highest order. By using the principle of detailed balance for the same resonance region, we also present Sc^{2+} photoionization cross sections that agree with the Advance Light Source measurements of Schippers *et al.* [2]. This higher-order perturbative method yields analytical expressions for the Fano asymmetry parameters q in terms of computed radiative and autoionization transition amplitudes.

[1] S. Schippers, et al., Phys. Rev. A **65**, 042723 (2002).
[2] S. Schippers, et al., Phys. Rev. A **67**, 032702 (2003).

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