Contribution ID: **142** Type: **Invited Poster**

QED radiative corrections to electric dipole amplitudes in heavy atoms

We report on the first detailed study of the interplay between QED and many-body effects in heavy atoms for E1 transition amplitudes. We use the radiative potential method and check its validity by comparing against the results of rigorous QED. We study the effects of core relaxation, polarization of the core by the E1 field, and valence-core correlations for the heavy alkali-metal atoms Rb, Cs, Fr, and alkali-metal-like ions Sr^+, Ba^+, and Ra^+. We identify several transitions in Cs for which the QED contribution exceeds the deviation between atomic theory and experiment.

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Track Classification: Precision Tests on Fundamental Physics