Internal and external radiative widths in the combined R-matrix and potential-model formalism

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By using the R-matrix approach we calculate the radiative width for a resonance decaying to a bound state through electric-dipole E1 Transitions. The total radiative width is determined by the interference of the nuclear internal and external radiative width amplitudes. For a given channel radius the external radiative width amplitude is model independent and is determined by the asymptotic normalization coefficient (ANC) of the bound state to which the resonance decays. It also depends on the partial resonance width. To calculate the internal radiative width amplitude we show that a single-particle-potential model is appropriate. We compare our results with a few experimental data.

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