Asymptotic normalization coefficients and radiative widths

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The asymptotic normalization coefficient (ANC) is an important quantity in the calculation of radiative width amplitudes, providing limits on the radiative width. Here we present some examples showing the connection between the ANC and radiative width. In particular, the radiative width of the $E1$ transition ^{17}F ($1/2^-$,E_x = 3.104 MeV) to ^{17}F ($1/2^+$,E_x = 0.495 MeV) reported by Rolfs [1] is $(1.2 \pm 0.2) \times 10^{-2}$ eV. Meanwhile the ANC for the first excited state in ^{17}F puts a lower limit on the radiative width, which is $(3.4 \pm 0.50) \times 10^{-2}$ eV. Such a strong disagreement between the measured radiative width and the lower limit imposed by the ANC calls for a new measurement of this radiative width.

We discussed also the role of the ANC in determination of the radiative width for the capture to the bound state through the subthreshold resonance. In this case the radiative width is determined by the product of the squares of the ANCs for the subthreshold bound state and the final bound state. The presented cases require new more accurate measurements of the radiative width. Other examples are also considered.

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[1] C. Rolfs, Nucl. Phys. **A217**, 29 (1973).