

# ANCs at sub-Coulomb energies to constrain key $\alpha$ -capture rates

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RM 124 NSH

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Many important  $\alpha$ -particle induced reactions can only be measured indirectly due to small cross section at energies of astrophysical interest. Extracting the Asymptotic Normalization Coefficients (ANCs) using sub-Coulomb  $\alpha$ -transfer reactions can be used as an effective method to determine properties of near-threshold resonances. This will constrain and drastically limit the uncertainties related to extrapolations procedures for key astrophysical reactions. We have applied this valuable tool to investigate the important  $\alpha$ -capture reactions  $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$  and  $^{13}\text{C}(\alpha, n)^{16}\text{O}$ . Results and the implication to the astrophysical rates will be discussed.