

The S_{E1} factor of radiative α capture on ^{12}C in effective field theory

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The S_{E1} -factor of radiative α -capture on ^{12}C is studied in effective field theory (EFT) up to next-to-leading order [1]. A modification of the counting rules for the radiative capture amplitudes is discussed [1,2]. We find that only two unfixed parameters remain in the amplitudes, and those two parameters are fitted to the experimental S_{E1} data. A value of the S_{E1} factor is calculated at the Gamow-peak energy, $E = 0.3$ MeV, as $S_{E1} = 59 \pm 3$ keV·b, and the result is found to be about 30% smaller than the estimates reported recently. An uncertainty of the estimate in the present work is also discussed.

We also discuss an application of the EFT to the study of the β delayed α distribution from ^{16}N [3].

[1] S.-I. Ando, arXiv:1806.09073v2 [nucl-th] (2018).

[2] S.-I. Ando, Phys. Rev. C 97, 014604 (2018).

[3] S.-I. Ando, in progress.