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Radiative Capture in the ^{4}He + ^{2}H System in the Framework of a Microscopic Approach

The nuclear ^{4}He + ^{2}H system is of great importance to nuclear astrophysics. Radiative capture proceeding in this system is responsible for production of the ^{6}Li nuclei during the primordial nucleosynthesis. In this work, the ^{4}He + ^{2}H radiative capture is considered from the microscopic viewpoint within a developed approach [1, 2] based on clustering aspects of nuclear structure and dynamics and formalism of expansions over the oscillator basis. The cross section in terms of the astrophysical S factor for the reaction are calculated. The low-energy dependence of the astrophysical S factor serves as a source of information useful for the so-called second "lithium puzzle". A comparison of the calculated results with experimental data is performed.

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1. A.S. Solovyev and S.Yu. Igashov, Phys. Rev. C **96**, 064605 (2017).
2. A.S. Solovyev and S.Yu. Igashov, Phys. Rev. C **99**, 054618 (2019).

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