Astrophysical factors of $^{12}C + ^{12}C$ fusion extracted using Trojan Horse method

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Carbon-carbon burning plays an important role in many stellar environments. Recently, Tumino *et al.* [1] reported a sharp rise of the astrophysical S factor for carbon-carbon fusion determined using the indirect Trojan Horse method. We demonstrate that the rise at low energies seen in the aforementioned work is an artefact of using an invalid plane-wave approximation that neglects the Coulomb interactions. Our analysis shows that such a rise disappears if the Coulomb (or Coulomb-nuclear) interactions in the initial and final states are included.

The paper has been submitted to Phys. Rev. C.

[1] A. Tumino *et al.*, Nature **557**, 687 (2018).