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Cross section measurements in the $^{12}\text{C}+^{12}\text{C}$ system

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Fusion reactions play an essential role in understanding the energy production, the nucleosynthesis of chemical elements and the evolution of massive stars. Thus, the direct measurement of key fusion reactions at thermonuclear energies is of very high interest. The carbon burning in stars is essentially driven by the $^{12}\text{C}+^{12}\text{C}$ fusion reaction. This reaction is known to show prominent resonances at energies ranging from a few MeV/nucleon down to the sub-Coulomb regime, possibly due to molecular $^{12}\text{C}-^{12}\text{C}$ configurations in ^{24}Mg [1]. The persistence of such resonances down to the Gamow energy is still an open question. This reaction could also be subject to the fusion hindrance phenomenon which has been evidenced for medium mass systems [2].

This contribution will discuss recent measurements performed in this system at deep subbarrier energies using the γ -particle coincidence technique.

[1] D. Jenkins and S. Courtin J. Phys. G: Nucl. Part. Phys. 42 034010 (2015);

[2] C.L. Jiang et al., Phys.Rev. Lett.89 052701(2002).

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