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Consequences of Heavy-Ion Fusion Hindrance on Explosive Astrophysical Processes. B.B. BACK, C.L. JIANG, R.V.F. JANSSENS, K.E. REHM, Argonne National Laboratory — Recent measurements of sub-barrier fusion of ^{60}Ni+^{89}Y[1], ^{64}Ni+^{64}Ni[2], ^{64}Ni+^{100}Mo[3], and ^{28}Si+^{64}Ni[4], as well as a re-analysis of older data from the literature, has unambiguously demonstrated that fusion cross sections at sub-barrier energies are substantially lower than predicted by present fusion models. Recently, it has been proposed that the additional compression energy inside the touching point of the fusing nuclei causes the observed fusion hindrance [5]. A close examination of published data on fusion reactions involving carbon and oxygen indicates that also these light systems are subject to the sub-barrier hindrance. This renders the standard extrapolations to the even lower energies, which come into play in explosive astrophysical processes, unreliable, and an extrapolation method, which is guided by the observed fusion hindrance, is therefore proposed [6]. This work was supported by the U.S. Department of Energy, Office of Nuclear Physics, under Contract No. DE-AC02-06CH11357. [1] C.L. Jiang *et al.*, Phys. Rev. Lett. **89**, 52701 (2002) [2] C.L. Jiang *et al.*, Phys. Rev. Lett. **93**, 12701 (2004) [3] C.L. Jiang *et al.*, Phys. Rev. C **71**, 44613 (2005) [4] C.L. Jiang *et al.*, Phys. Lett. **B640,** 18 (2006) [5] S. Misicu and H. Esbensen, Phys. Rev. Lett. **96**,112701 (2006) [6] C.L. Jiang *et al.*, Phys. Rev. C **75**, 015803 (2007)

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