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^{7}Be + p and ^{3}He + ^{4}He fusion reactions and neutrino astrophysics[1]

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The ^{7}Be + p and ^{3}He + ^{4}He fusion reactions are important steps in the solar p-p chain that lead to the production of neutrinos from decay of ^{8}B and ^{7}Be in the Sun. Until recently the uncertainty in the ^{7}Be + p S-factor was the largest error in the calculated solar model production rate of neutrinos from ^{8}B decay, while now it is no longer important [1,2]. The uncertainty in the ^{3}He + ^{4}He S-factor is now the largest nuclear physics uncertainty in the calculated solar model production rate of neutrinos from both ^{8}B and ^{7}Be decay [2]. I will discuss the current status of these fusion experiments and the implications for neutrino physics including limits on sterile neutrinos.

[1] A. R. Junghans et al., Phys. Rev. C 68, 065803 (2003).
[2] J. N. Bahcall and M. H. Pinsonneault, Phys. Rev. Lett. 92, 121301 (2004).

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