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A closer look at the pp-chain reaction in the Sun: Constraining the coupling of light mediators to protons

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In this talk, I will explore a surprising connection between speculative issues in elementary particle physics and the Sun. I will show how the extreme sensitivity of nuclear reaction Coulomb barrier penetration at the low energies of the solar core and the recent observation of the CNO neutrinos from the Sun by the Borexino collaboration could be leveraged to probe aspects of the non-standard interactions involving light mediators recently invoked to explain anomalies in short baseline neutrino experiments. Moreover, with an improved determination of solar metallicity, and a more precise measurement of the CNO flux it is very likely that our limits on the mass and the coupling of the non-standard mediators will improve even more.

Collaboration name

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