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Prospects to evidence of Carbon-Nitrogen-Oxygen (CNO) fusion cycles using solar neutrinos by Borexino experiment XUEFENG DING, Princeton University, BOREXINO COLLABORATION — Neutrinos emitted in the sub-dominant Carbon-Nitrogen-Oxygen (CNO) fusion cycles in the Sun are the only component of the low energy solar neutrino spectra whose flux has not yet been measured. The Borexino detector is an un-segmented liquid scintillator calorimeter and detects solar neutrinos via their elastic scattering on electrons. To measure the CNO solar neutrino interaction rate, the activity of its major background ^{210}Bi decay need to be determined, and this is possible if convection motion of liquid scintillator is suppressed. After four years of efforts, from the thermal insulation of the detector to recent commissioning of experimental hall negative feedback heating system, we are able to stratify and stabilize the detector temperature profile and to collect enough data free from convection motion. This paves the way to the evidence of CNO solar neutrinos. We discuss in this talk the principle and sensitivity to CNO solar neutrinos of Borexino, as well as results on temperature stabilization and analysis of convection free data.

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