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Geoneutrino Measurement at JUNO

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The Jiangmen Underground Neutrino Observatory (JUNO) is a multipurpose experiment currently under construction at an equal distance of 53 km from two nuclear power plant complexes in southern China, Yangjian and Taishan, with foreseen start of data taking in 2021. The experiment will primarily study reactor antineutrino oscillations with the goal of determining the neutrino mass hierarchy at the level of $\sim 3\sigma$ and of measuring three oscillation parameters (θ_{12} , Δm_{31}^2 , Δm_{32}^2) with $<1\%$ precision. Antineutrinos will be detected in the 20 kt liquid scintillator central detector, which will be the largest and most precise of its kind in history. In addition to reactor antineutrinos, the experiment will collect an unprecedentedly large sample of geoneutrinos. The measurement of the geoneutrino flux provides important constraints on the abundance of Earth's radiogenic elements and is of much interest to the geoscience community. The JUNO experiment aims to measure this flux with $\sim 5\%$ precision in 10 years. The precision depends heavily on the knowledge of the reactor antineutrino spectrum, the dominant background for geoneutrinos in JUNO. The ~ 1 t JUNO-TAO reference detector, placed at 30 m from one of Taishan's reactor cores, will be built to measure the shape of the reactor neutrino energy spectrum with very high statistics and an unprecedented resolution. The overview of the JUNO experiment and its current status will be discussed, with a focus on the challenges and opportunities of the geoneutrino measurement.

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