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P1.020 **Neutrino telescopes with the deepest overburden: The Jinping neutrino experiment**

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Jinping Neutrino Experiment (Jinping) is a unique observatory for low-energy neutrino physics, astrophysics and geophysics, with 4 kiloton of LS or WbLS. Jinping is located in China JinPing Laboratory (CJPL), identified by the thickest overburden, lowest reactor neutrino background, dominant crustal geo-neutrino signal, lowest environmental radioactivity, etc.

In this poster, we will present the strong potential of Jinping towards solar neutrinos, geo-neutrinos and other physics.

A number of sensitivity analysis and initial detector R&D studies have been carried, showing Jinping's capacity to measure the transition phase for solar neutrinos oscillation from the vacuum to the matter effect, to discover solar neutrinos from the CNO cycle, and to resolve the high and low metallicity hypotheses with known neutrino oscillation angles, by more than 5 sigma.

It has been calculated that Jinping will be able to precisely measure geo-neutrinos with an unambiguous separation on U and Th cascade decays from the dominant crustal anti-electron neutrinos. The estimated event rates of 37 U and 9 Th geo-neutrino events/year/kton will be significantly above the expected ≤ 6 reactor neutrino events/year/kton. The ratio of U/Th can be determined to 10%.

We also expect a promising sensitivity for neutrinos from a Milky Way supernova, the diffuse supernova neutrino background, and dark matter annihilation.

These physics goals can be fulfilled using mature techniques and the unique opportunity of the CJPL. The first, small phase of the laboratory (CJPL I) is already in operation, hosting dark matter experiments. The second, large phase (CJPL II) is already under construction, with ≈ 100,000 m^3 being excavated.