

# A 400kV High Intensity Accelerator facility for Jinping Underground Nuclear Astrophysics Experiments

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Direct measurement of the cross sections for the key nuclear reactions is crucial for obtaining benchmark data for stellar model, verifying extrapolation model, constraining theoretical calculations, and solving key scientific questions in nuclear astrophysics. However, reaction cross-sections of the astrophysical reactions are extremely small. Tiny reaction rates in laboratories at the earth's surface are hampered by the cosmic-ray background. With the ultra-low underground lab becomes a promising solution of experimental nuclear astrophysics. China JinPing Underground Laboratory (CJPL) is currently deepest underground site in the world. For such experiments, a 400kV, 10mA accelerator specially designed for Jinping Underground Nuclear Astrophysics (JUNA) will be placed in CJPL. In this paper the layout and design considerations of accelerator, such as beam optics, high intensity beam accelerating, transmission and other special features applied in the Jinping deep underground lab are presented.

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