VOLTAGE CALIBRATION AND ENERGY SPREAD MEASUREMENT FOR JUNA 400 KV ACCELERATOR

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Four key reactions, $^{12}C(\alpha,\gamma)^{13}O$, $^{13}C(\alpha,n)^{16}O$, $^{25}Mg(p,\gamma)^{26}Al$ and $^{19}F(p,\alpha)^{16}O$, will be studied for the first time within or near the astrophysical relevant energy regions (Gamow window) at Jinping Underground laboratory for Nuclear Astrophysics (JUNA), which will take the advantage of the ultra-low background of China JinPing underground Laboratory (CJPL), high current accelerator based on ECR source and a highly sensitive detection system. A 400 kV accelerator with high stability and high intensity is under construction at CIAE and IMP, CAS and will be ready to operate in the end of year 2016. To obtain the information about the beam characteristics, like absolute energy, energy spread and long-term energy stability, a series of experiments of several well-known resonance and non-resonance reactions will be performed ahead of the campaign.

The absolute energy can be determined by using the energy of the capture γ-ray transition of $^{12}C(p, \gamma)^{13}N$ as well as resonance energies at E_p = 163 – 389 keV of $^{11}B(p, \gamma)^{12}C$, $^{23}Na(p, \gamma)^{24}Mg$, $^{25}Mg(p, \gamma)^{26}Al$, $^{26}Mg(p, \gamma)^{27}Al$ and $^{27}Al(p, \gamma)^{28}Si$. Study of the resonance reactions may also obtain the value of energy spread and long-term energy stability of beam. A testing experiment for $^{12}C(p, \gamma)^{13}N$ and $^{27}Al(p, \gamma)^{28}Si$ reactions were performance at 320 kV high-voltage platform in the beginning of year 2016. In this contribution, we will report the result about the testing experiment and the present status of JUNA project.