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The Beam Commissioning of BRIF and Future Cyclotron Development at CIAE

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As an upgrade project of the existing HI-13 tandem accelerator facility, the Beijing Radioactive Ion-beam Facility (BRIF) is being constructed in China Institute of Atomic Energy (CIAE). This project consists of a 100MeV compact cyclotron for high current proton beam, a two-stages ISOL system, a superconducting linac booster and various experimental terminals. The design and construction progress of BRIF were invited to presented else where [1,2,3]. In this paper, the recent progress of BRIF will be presented briefly. The beam commissioning of the cyclotron is in progress and we got the first 100 MeV beam on July 4, 2014. The beam current was stably maintained at above 25 μA for about 9 hours on July 25, 2014, which is ready for providing CW beam on target for RIB production. 200 μA to 500 μA proton beam will be provided in the coming years. The installation of ISOL system is finished and the stable ion beam test shows it can reach a mass resolution better than 14000. It is expected to generate dozens of RIB by 100 MeV proton beam. In additions, this paper also introduce the recent progress of the pre-study of a 800 MeV, 3-4 MW separate-sector proton cyclotron, which is proposed to provide high power proton beam for several applications, such as neutron and neutrino physics, proton radiography and nuclear data measurement and ADS study as well.

[1] Tianjue Zhang et al., 100 MeV H- Cyclotron as an RIB Driving Accelerator, Proc. Of 17th International Conference on Cyclotrons and Their Applications (Invited), Oct. 18-22, 2004, Tokyo

[2] Tianjue Zhang, et al., Physics problem study for a 100 MeV, 500 microAmp H- beam compact cyclotron, 10th International Computational Accelerator Physics Conference (Invited), Aug 31-Sept 4, 2009, San Francisco

[3] Tianjue Zhang, The Cyclotron Development Activities at CIAE, 10th European Conference on Accelerators in Applied Research and Technology (Invited), September 13-17, 2010, Athens, Greece

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