



## Neutron source

### The development progress of the high current tandem accelerator for BNCT in KIRAMS

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KIRAMS (Korea Institute of Radiological & Medical Sciences) decided to ride the wave of AB-BNCT research in 2018. Cyclotron was considered for the very first model but proton energy over 10 MeV was not allowed in KIRAMS facility. In late 2019 the accelerator was change to electrostatic(ES) accelerator. A 1.5 MeV single-ended electrostatic deuteron accelerator was considers at the beginning. Accordingly technology transfer for an in-air operating 240 kV ES accelerator was carried out from CNEA (Argentina) for fast track. This accelerator was planned accelerate the deuteron to 1.5 MeV after upgrade. But the pandemic of COVID-19 made slower this project. In the meantime, for not wasting the time, KIRAMS started to develop a tandem accelerator by own efforts with the help of BINP(Russia) and NEC(USA). Both accelerators were successful but the final accelerator will be the tandem accelerator because it is more suitable for hospitals with limited area. An in-air ES accelerator is easy to access but needs sufficient space for isolate high voltage over 1,000 kV. The tandem accelerator will place in a smaller SF<sub>6</sub> tank for isolation the high voltage. And deuteron accelerator needs more radiation shield area for security because the D-D reaction during acceleration should be considered. A prototype of 250 kV tandem accelerator with Ar gas stripping terminal was constructed and successfully proton beam of 500 keV / 6 mA was injected. In this year 1,200 kV tandem accelerator for accelerating proton to 2.4 MeV / 10 mA will be constructed and investigate the high voltage isolation performance.



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