

KREINER-1: Development of Accelerator Technology for BNCT in Argentina

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There is an international consensus that Accelerator-Based BNCT (AB-BNCT) may change the prospects of BNCT due mainly to the possibility of in-hospital siting in contrast to reactor-based facilities. Hence, there is a quest worldwide for finding technological solutions for such a facility. Decision criteria may be: simplicity, safety and lowest possible cost in order to promote widest possible dissemination.

There are several high intensity accelerator-based facilities being constructed and tested worldwide. The different options work on different nuclear reactions, beam energies and currents, resulting primary neutron spectra features, target design and complexity, resulting epithermal neutron beam characteristics, type of machine, cost, etc. Merits and demerits can hence be compared.

In particular, the progress of the Argentine Electrostatic Quadrupole accelerator is described. This machine is conceived to work in air to minimize the number of ancillary systems and facilitate its maintenance. A smaller-than-final-size prototype is ready which has been shown to transmit proton beams of about 10 mA. Beam diagnostics through fluorescence induced in the residual gas of the accelerator tube and emittance determinations will be shown.

Our attention is preferentially focused on deuteron-induced reactions and in particular on $^9\text{Be}(\text{d},\text{n})^{10}\text{B}$ and $^{13}\text{C}(\text{d},\text{n})^{14}\text{N}$, since they allow for the smallest possible machines. Its suitability for AB-BNCT will be discussed. Progress in Be- and C-based neutron production targets will also be briefly described.

A new accelerator development laboratory and future treatment facility is under advanced construction in Argentina and its current status will be described.