neutron source

Evolution of the ion beam diagnostics on the accelerator based neutron source VITA

Yaroslav Kolesnikov, Timofey Bykov, Dmitrii Kasatov, Alexey Koshkarev, Sergey Savinov, Ivan Shchudlo, Evgeniia Sokolova, Sergey Taskaev

Budker Institute of Nuclear Physics, Novosibirsk, Russia
Novosibirsk State University, Novosibirsk, Russia
E-mail: Ya.A.Kolesnikov@inp.nsk.su

Diagnostics of the ion beam parameters is an important part of the accelerator based neutron source work cycle. Such parameters are ion beam energy, current, profile, size, phsase portrait etc from an ion beam source to the lithium neutrongenerating target. These diagnostics system should cover wide range of ion beam energy, current and power density – beam energy from 0.1 to 2.3 MeV, beam current from 0.1 nA to 10 mA, power density from 1 mW/cm^2 to 20 kW/cm^2. These wide ranges of parameters are required to conduct investigations from performing BNCT to measuring cross-sections of different nuclear reactions.

This paper describes the ion beam parameters at the accelerator based neutron source VITA, lists the researches that are performed at VITA, and summarizes the evolution of the diagnostic tools used at VITA over the last decade from exotic ones, which were improvisations during investigations to permanent diagnostics that work routinely.

Acknowledgments:
This research was funded by Russian Science Foundation, grant number 19-72-30005