

Comparison of Synchrotron and Accumulator Scenarios for a 5-MW Pulsed Spallation Neutron Source*, L. BLUMBERG, A. LUCCIO,

A.G. RUGGIERO and A. VAN STEENBERGEN, Brookhaven National Laboratory - A feasibility study of a 5-MW pulsed spallation neutron source was carried out at Brookhaven for a period of about two years. Two scenarios were investigated, one based on a 600-MeV Linac injecting into two rapid-cycling synchrotrons for acceleration to 3.6 GeV, and the other on a 1.25-GeV Linac feeding two constant-field accumulator rings. It was determined that one is limited with the maximum number of beam turns that can be injected with the synchrotron scenario to about 300 hundred, whereas the accumulator scenario allows as many as a thousand of turns. This eventually leads to the same requirement of ion source with a peak current of about 100 mA for both scenarios. The accumulator scenario is to be preferred because, though it requires a Linac of larger energy, it removes limitations with the accelerating rf system, vacuum, magnet and power supply systems which are more demanding for synchrotrons. Moreover, the beam losses appear easier to be controlled during injection at constant beam energy.

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