

ADVANCES IN SRF FOR NEUTRON SOURCES

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Abstract

There have been studies for applications of superconducting radio-frequency (SRF) technologies to the proton or deuteron accelerators to generate high intensity neutrons. The areas of interests are neutron scattering, material test and accelerator driven systems for nuclear transmutation, energy generation, isotope production, and etc. Advantages of the SRF technology for high power proton/deuteron accelerators include high operating gradient, low beam loss from large aperture size and extremely high vacuum, high RF power transfer efficiency to beam, and operational flexibility. Many technical advances of SRF technologies from various programs have been applied to the high power accelerators for meeting their missions, which enables designs, constructions, and operations of high intensity accelerators at multi-megawatts level or higher. Major large scale operational and future neutron sources using the SRF technologies are presented together with their specific merits, requirements and issues.

**CONTRIBUTION NOT
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