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Reliability analysis of SNS SRF linac and perspective for future high-power proton SRF linacs

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Future proton superconducting RF (SRF) linacs used as accelerator driven systems (ADS) must achieve high reliability and availability to meet the challenging parameters for applications in medical treatment, nuclear waste reduction, and nuclear power generation. What SRF innovations and advanced concepts are needed? To answer this question, a case study of the past, current, and possible future downtime sources is carried out for the Spallation Neutron Source (SNS) SRF linac systems. SNS is an accelerator-driven neutron source facility routinely operated at a 1.4 MW beam power with a 99% availability in its SRF systems and is currently undergoing an upgrade to a new level capable of a 2.8 MW beam power. The preliminary outcome of this study is to be presented. We will discuss its implications to the needed development of the next generation SRF systems and related systems towards 10-20 MW proton SRF linacs required for future ADS facilities.

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Footnotes

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Yes

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