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Estimation of Hot S-parameters of Power Amplifiers at ESS

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ESS is poised to be a high intensity and high energy neutron source for scientific applications. The source behind this high intensity neutron beam is a long pulse linear proton accelerator. In order to meet the stringent requirements on the proton beam, the protons need to be accelerated in stable accelerating gradients in the accelerating cavities. In order to achieve this, the LLRF system controlling the cavity gradients needs to be designed and tuned precisely, so that cavity gradients may be maintained in the presence of long loop delay and gain and phase margin requirements. This makes it necessary to identify the characteristics of the active components involved in the RF signal chain and have accurate models of the same. The power amplifiers are one such major active component and in this paper we describe the method used to measure and model the S-parameters of the klystrons while they are made to operate at nominal conditions.

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Footnotes

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Yes

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