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Application of High Precision RF Measurement for ESS Cavities

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The ESS cavity operation is challenging due to long RF pulse, high gradient, high beam power and high demands for energy efficiency and availability. These require a better understanding of RF-cavity dynamics and insight into RF-cavity interaction. RF and cavity dynamics identification relies heavily on high precision measuring and characterizing basic cavity parameters (Q, dynamic detuning, phase, amplitude, etc). Thanks to advanced hardware capabilities and software intelligence, cavity basic parameter measurement has achieved good precision at ESS and played important role for different cavities. It enables us to observe some critical RF-cavity dynamics during ESS cavity testing and conditioning. Application of high precision measurement of cavity basic parameters will be introduced. Some RF-cavity interaction and dynamics such as Lorentz Force Detuning and quench detection will be reported. Further application development of high precision measurement for cavity with heavy beam loading will also be discussed.

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

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