

Thermal Behaviour of SRF Cavities at High Gradients, S. BOUSSON, M. FOUAIDY
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H. SAFA, DSM/DAPNIA/SEA CE SACLAY - At high gradients ($E_{acc} > 15$ MV/m), SRF cavities show anomalous RF losses resulting in a strong Q_0 decrease although no electrons activity or X-rays are detected. Tests performed on such cavities equipped with surface thermometers clearly show no quadratic heatings with respect to the accelerating field. In some cases these heatings lead to cavity thermal breakdown or quench. Numerical simulations using thermal code allowed us to study the SRF cavity thermal behaviour in transient regime. The effect of different parameters on the cavity behaviour and the thermal stability are investigated. Special attention is attached to the cavity quench phenomena. Some results on the quench dynamic are confirmed by experimental measurements of the normal zone propagation velocity during thermal breakdown of different cavities.

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