

**Investigation of the Enhanced Field Emission Process on Niobium by Changing the Properties of Individual Emission Sites,**

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N. PUPETER, Universität Wuppertal - The enhanced field emission (EFE) is one of the main limits in the performance of superconducting Nb accelerating cavities. The reduction of the EFE sources as well as the understanding of the emission process are important for particle accelerators with high gradients. Our previous DC FE studies by means of a FE scanning microscope, a scanning electron microscope and auger electron spectroscopy proved that after today's surface preparations EFE is mainly caused by micron-sized particles of different elemental composition, but there are also non emitting particles on well prepared surfaces. The physical mechanism of the EFE and the properties of these contaminations, which are responsible for the electron emission, are still unknown. We investigated the FE, the morphology and the elemental composition of single particles in dependence on surface removal by means of Ar-ion sputtering to reveal whether the surface properties of a particle or the contact between particle and cathode is causing the EFE. We also studied the influence of current processing and UHV-heat treatment at high temperatures on field emitters, both of which are known to suppress EFE.