

A S-Band Test Cavity for a Field Emission Based RF-Gun, A. GASPER, C. PIEL, T. WEIS, DELTA, University Dortmund; A. GOEHL, T. HABERMANN, G. MUELLER, FB8 PHYSIK, University Wuppertal - A test-bed is under construction at the Dortmund Test Accelerator (DELTA) which will give the opportunity to investigate cathode based on field emission in the environment of a S-band cavity. We aim for surface electric fields of 50-200 MV/m to allow for the study of field emitters of various types and the development of a field emission based rf-gun. The strength, uniformity and stability of as-fabricated cathodes have been systematically controlled with a field emission scanning microscope. Stable electron current densities up to 1 A/mm^2 at 70 MV/m have been achieved from many um-sized spots of carbon-based films on Si substrates. Results on conditioning and integral current measurements on cathodes of 7 mm diameter will be given. The paper also presents the special design of the test cavity, the status of the test-bed and first results.