Abstract Submitted for the TSF09 Meeting of The American Physical Society

Superconducting RF Cavity for Testing Materials and Fabrication Processes at 1.3 GHz at over 3 times the BCS Limit of Niobium<sup>1</sup> NATHANIEL POGUE, PETER MCINTYRE, AKHDIYOR SATTAROV, Texas A&M University — A 1.3 GHz test cavity has been designed to test wafer samples of superconducting materials. The surface magnetic field on the sample wafer is 3.75 times greater than anywhere else on the cavity surface. The cavity also facilitates measurement of the rf surface resistance corresponding to a Q of  $10^{10}$ . The cavity is operated in a TE(01) mode. A high purity sapphire hemisphere is used to enhance the circulating field on the sample and suppress the fields on the remainder of the cavity surface. The sapphire purity must be tested for its loss tangent and dielectric constant. To test these properties a smaller sapphire rod of the same quality will be inserted into a CEBAF cavity operating in a TE(01) mode. This will allow us to measure the temperature of the sapphire as a function of input energy and time, and the dielectric constant through its effect on the resonant frequency.

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