

## **SQUID-BASED SCANNING SYSTEM FOR DETECTING DEFECTS IN Nb SHEETS FOR RF CAVITIES**

W. Singer, A. Brinkmann, DESY  
F. Schölz, A. Farr, E. Wappler, WSK  
M. Mück, ez-Squid

### *Abstract*

The conventional eddy current system for detecting material defects in Nb sheets for superconducting cavities has limited sensitivity. WSK Mess- und Datentechnik in Hanau has developed a system for scanning Nb sheets for 1.3 GHz cavities. The system uses SQUID detectors for measuring the eddy current's secondary magnetic field with an extremely high sensitivity and excellent signal/noise ratio.

The scanner is based on a xyz table with ca. 300 mm x 300 mm travel area. The low TC SQUID is situated within a 1.5 l fibre glass He cryostat fixed at the z axis. The eddy current is generated by a selectable coil of diameter 1-3 mm. In order to maximize the resolution of the sensor the magnetic field of the excitation coil can be minimized at the sensor location by a fine adjustable compensation current. The SQUID is used with a flux compensating amplifier; the amplifiers output is then processed by a lock-in amplifier to gain the magnetic field in phase and with 90° phase shift at the location of the squid sensor. Different filters are implemented into the lock in amplifier to improve the signal/noise ratio. The lift-off effect has been minimized by the geometry of the coil. The system works in a non-shielded environment.

**NO SUBMISSION RECIEVED**