

The TESLA JT SPM

M. Maier, D. Stahl, A. Pirou, M. Fenner, T. Roth

Scienta Omicron GmbH

(corresponding author: M. Maier, e-mail: markus.maier@scientaomicron.com)

The TESLA JT SPM provides access to more than 5 days SPM measurement time at temperatures down to 1K (⁴He operation) with magnetic fields larger than $B > 3T$. Careful thermal design of the bath cryostat and JT cooling stage as well as the integrated UHV magnet lead to exceptionally low LHe consumption, specifically during magnet operation. The external JT Helium supply allows for ³He operation and significantly lower temperatures.

The microscope head is a proven, highly stable design developed specifically for high magnetic field environments. It offers the full range of SPM measurements modes, including Scienta Omicron's leading QPlus AFM technology.

Safe and independent tip/sample exchange under optical control is one of several key ease-of-use features delivering dependable high performance SPM and successful scientific work.

In contrast to a conventional wet magnet concept, the dry split-pair magnet provides for optical access enabling various optical experiments and even in-situ evaporation into the SPM at low temperatures.

We will discuss the technical concept and will show performance evaluation measurements at T=1K that prove stability below 1pm, energy resolution on superconductors, continuous STM imaging and spectroscopy during magnetic field variation.