LT-STM/AFM | Scanning Tunneling Spectroscopy Results

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Scanning Tunneling Spectroscopy (STS) experiments were performed to demonstrate the ultimate performance of our CreaTec LT-STM systems. Therefore, a superconducting Pb(111) single-crystal and a Pb tip were used to measure STS spectra at 1.8 K using the latest CreaTec DSP electronics. The modulation amplitude of the internal CreaTec Lock-In Amplifier was set to very small values in the range of a few µV, i.e. far below kT, to eliminate the influence of the modulation amplitude. As a consequence, the main contribution to the energy resolution is the temperature of the STM itself.

SPECTRA

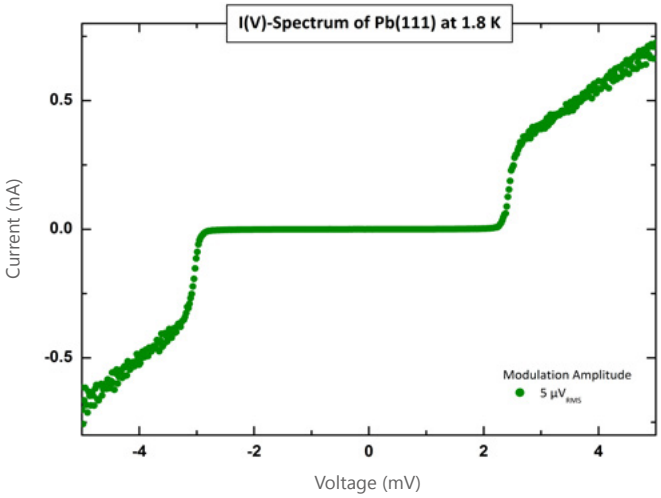

Fig. 1: I(V) spectrum clearly showing the superconducting gap in the tunneling current.

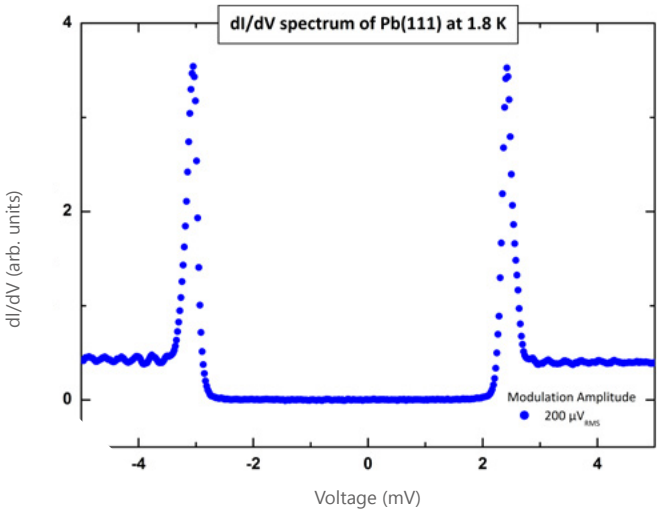

Fig. 2: dI/dV spectrum of the same sample at a different modulation amplitude.

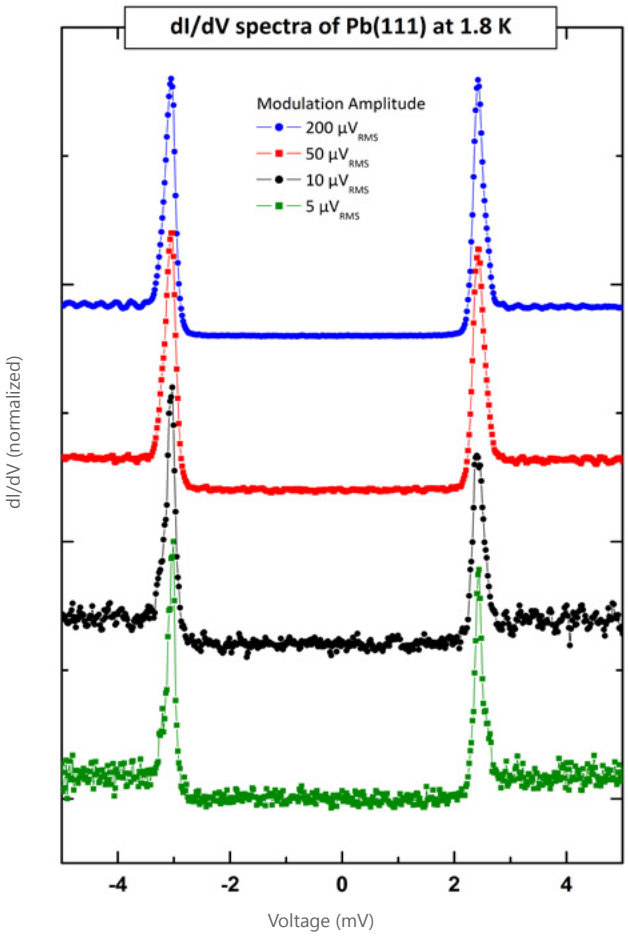

Fig. 3: dI/dV spectra of the same sample at different modulation amplitudes in the range of 5-200 µV (bottom to top).

The spectra are non-averaged single spectra (raw data) recorded with the following parameters:

- *1024 points/spectrum*
- *15 second/spectrum*
- *Bias Voltage 10 mV*
- *Tunneling Current setpoint 100 pA*
- *T=1.8 K (kT=154 µeV)*

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