

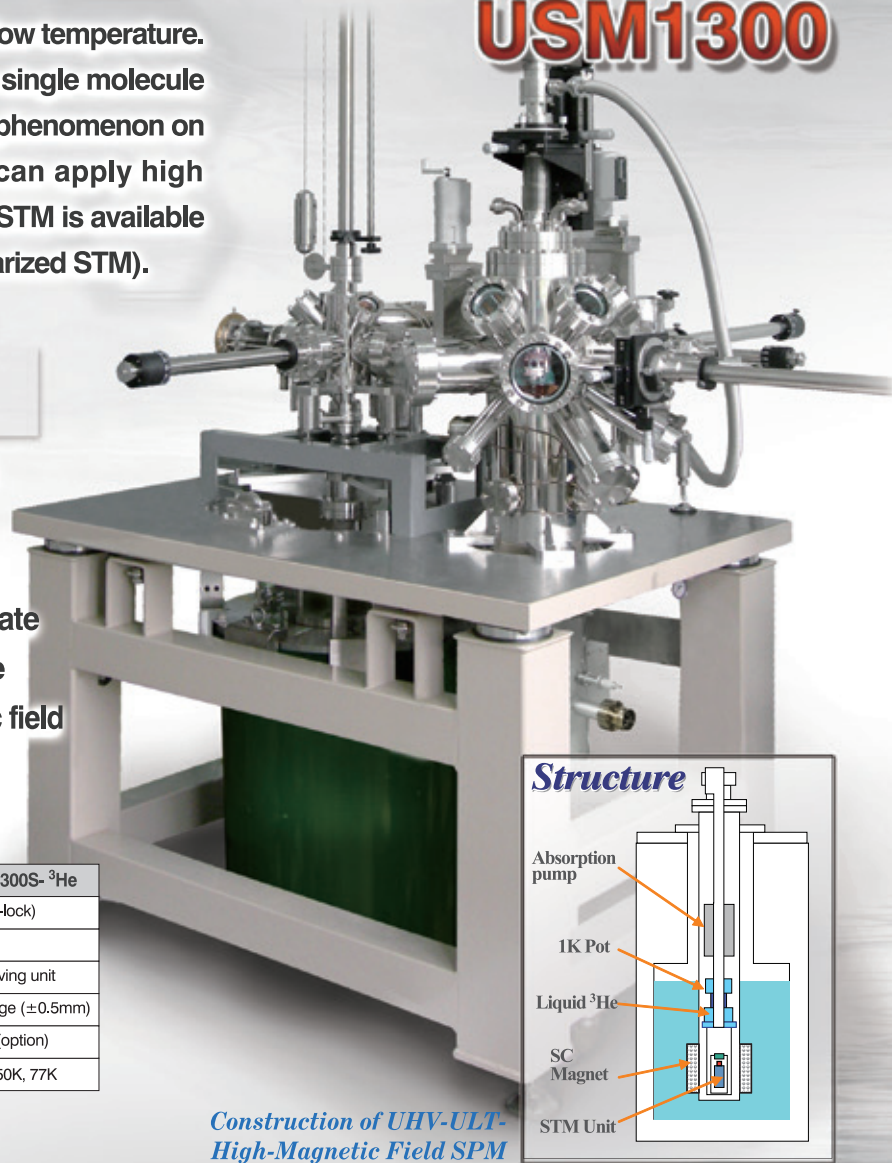
UHV Ultra Low Temperature and High Magnetic Field SPM System

This system is designed for stable STM at ultra low temperature. This system is suitable for the spectroscopy on single molecule (IETS) and useful for the observation of various phenomenon on surface at low temperature. Moreover you can apply high magnetic field during STM measurement. This STM is available for spin analysis of magnetic material (Spin-polarized STM).

USM1300

Application

- Spectroscopy on single molecule(IETS)
- LDOS mapping on surface
- Spin polarized STM
- Measurement of electric state in ground state
- Observation of structure in ground state
- Observation of electric state in high magnetic field

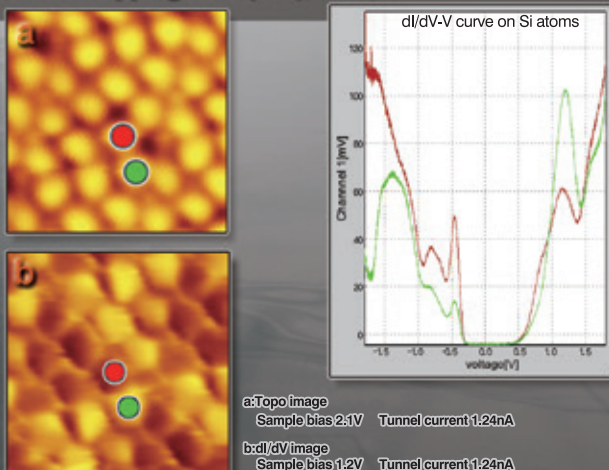


Line up of USM1300-seriese

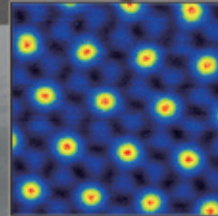
	USM1300S ⁴ He	USM-1300S ⁴ He VTI	USM-1300S- ³ He
Chamber	4 chambers system (Insert, exchange, preparation, Load-lock)		
Vacuum system	Bellow 1.3×10^{-8} Pa, (exchange, preparation)		
Additional option	E-beam heating of sample and Tip, Ar Ion gun, Cooling cleaving unit		
Scanner	X, Y = $2\mu\text{m}/0.6\mu\text{m}$, Z = $0.3\mu\text{m}/0.08\mu\text{m}$ (RT/4.2K) Coarse X,Y stage ($\pm 0.5\text{mm}$)		
Magnetic field	Vertical direction to sample surface, 7T (standard)		11T (option)
Temperature	4.2K, 77K	2K-50K, 77K	0.4K-50K, 77K

Construction of UHV-ULT-High-Magnetic Field SPM

LDOS mapping on Si(111), 4.2K, 7T

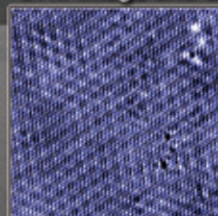


STM Image of vortex lattice of a superconductor NbSe₂



Measurement conditions:
Temperature: 400 mK
Magnetic field: 0.5 T
Environment: UHV
Field of View: 250nm×250nm

STM Image and STS data of Cleaved NbSe₂



Measurement conditions:
Temperature: 440 mK
Field of View: 7.3nm×7.3nm

Both Images and data are from Dr. HANAGURI in Magnetic Materials Laboratory, RIKEN

(dI/dV)/IV spectroscopy

Conductance (arb. units)

NbSe₂ T = 440mK

Sample bias (mV)