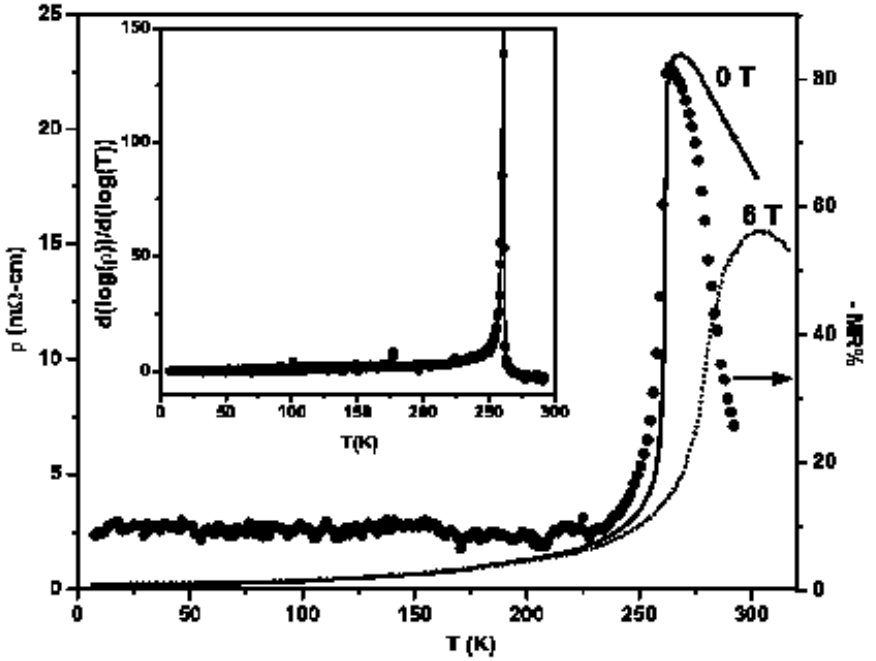
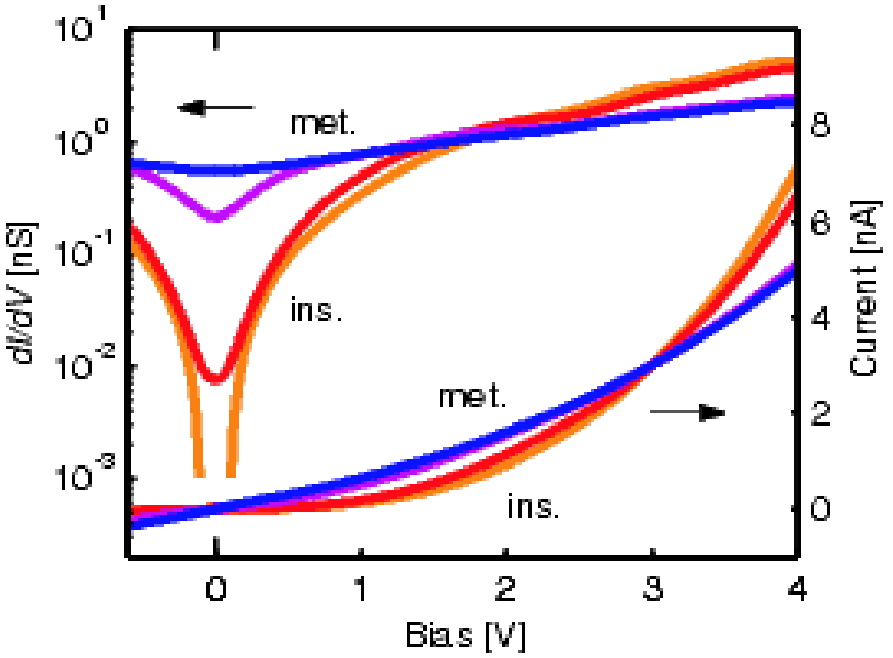
Investigating the MI (or IM) transition in La0.67Ca0.33MnO3 via STM/STS
LCMO(50nm)/NGO (L422): preliminary results.

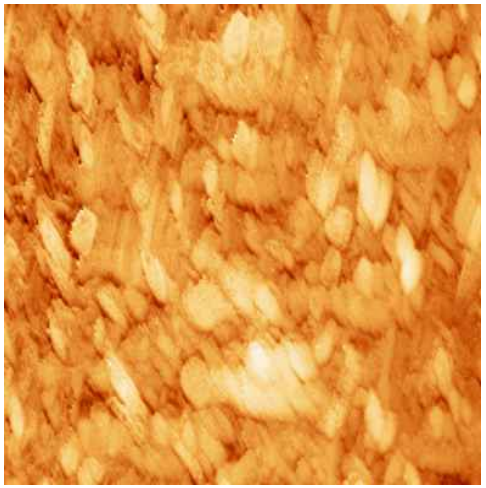


Mitra et al. PRB 71, 094426 (2005)

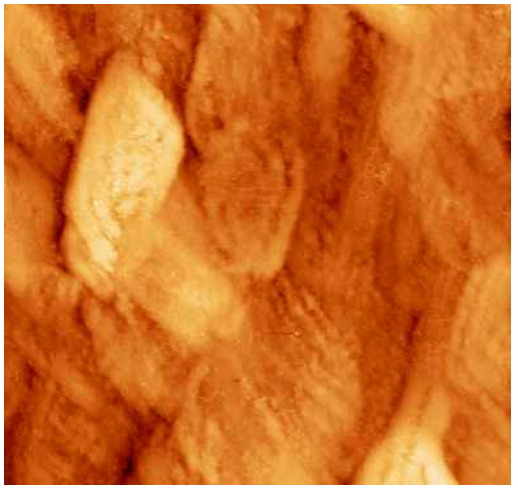


Fath et al., Science 285, 1540 (1999)

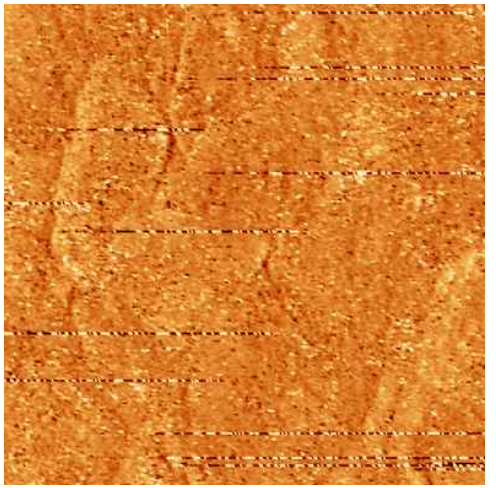
Some topography and LC-MAP



Topo, 1000nm x 1000nm

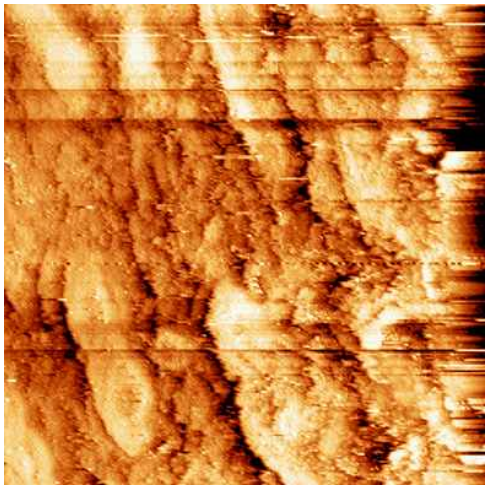


Topo, 250nm x 250nm

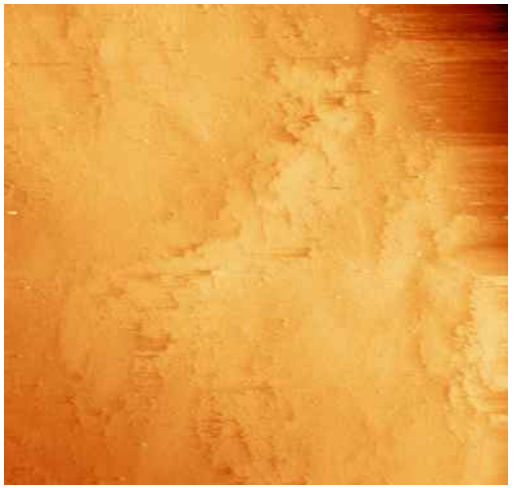


LC-MAP 250nm x 250nm

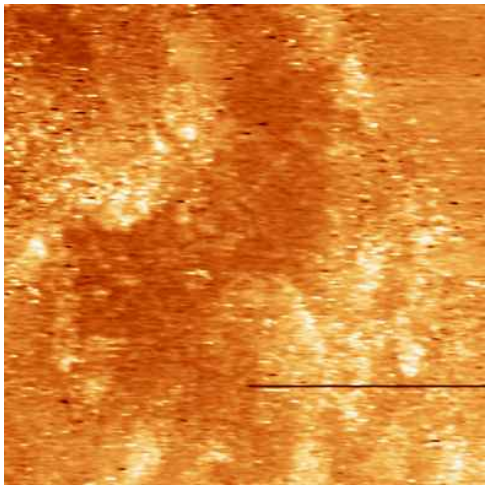
285 K



Topo, 500nm x 500nm



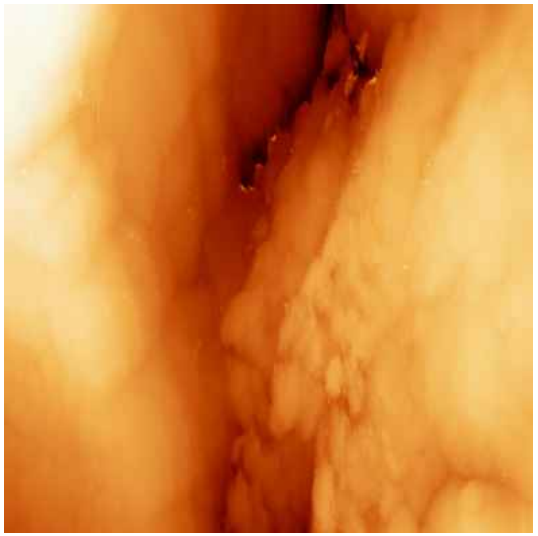
Topo, 240nm x 240nm

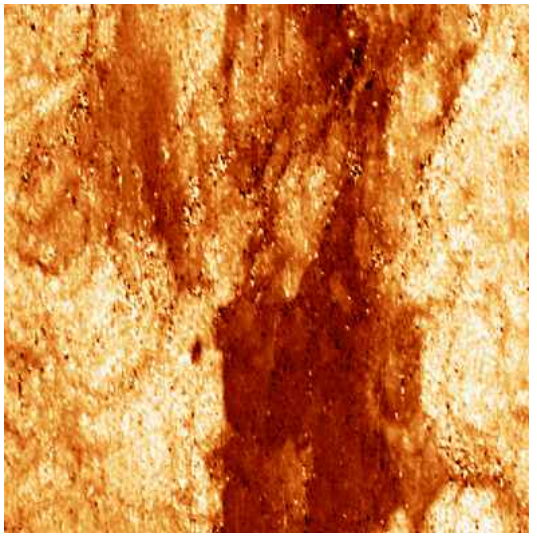


Topo, 240nm x 240nm

273 K

Some topography and LC-MAP

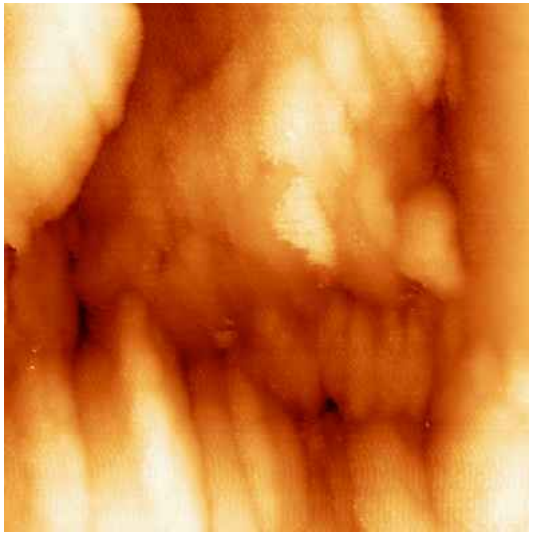


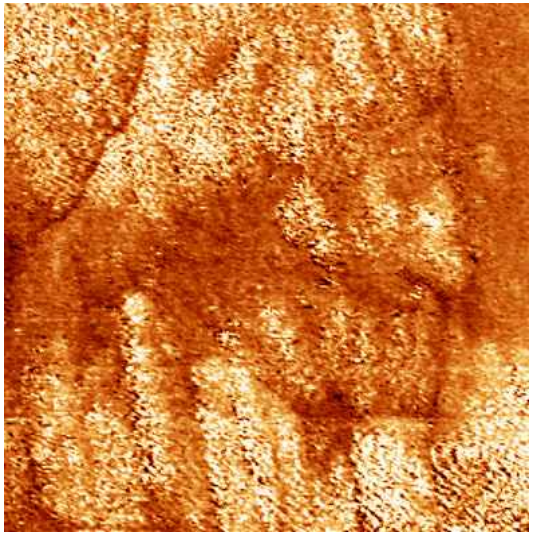


topo

LC-MAP

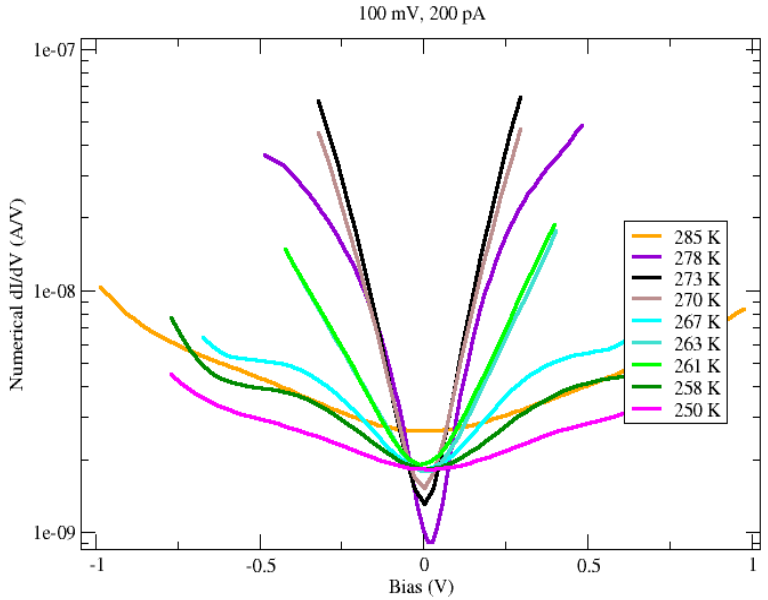
263 K, 250 nm x 250 nm
50 pA, 200mV, 8mV-AC.

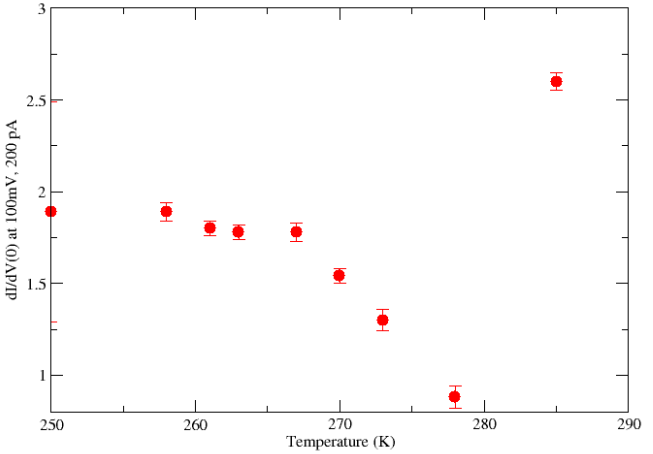


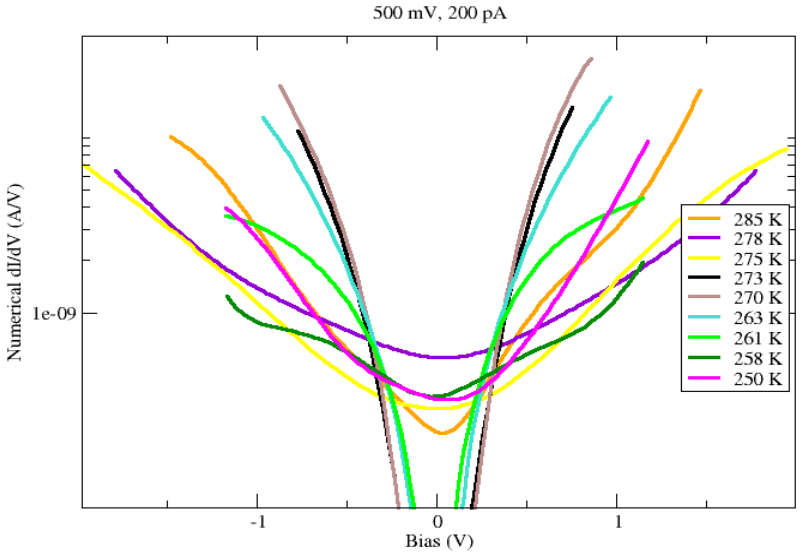


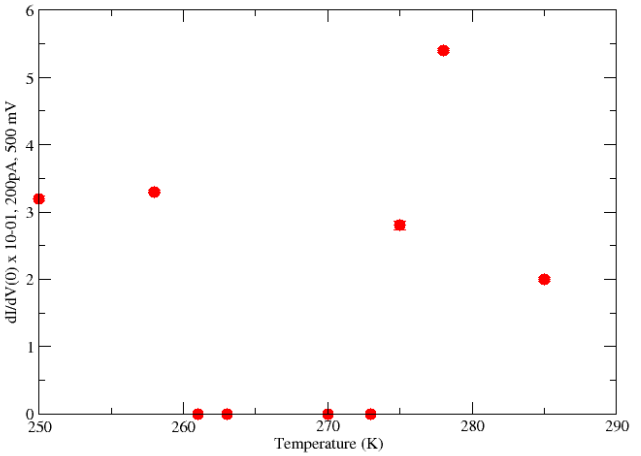
180 K, 65 nm x 65 nm
50 pA, 250mV, 12mV-AC.

Spectroscopy: temperature dependence

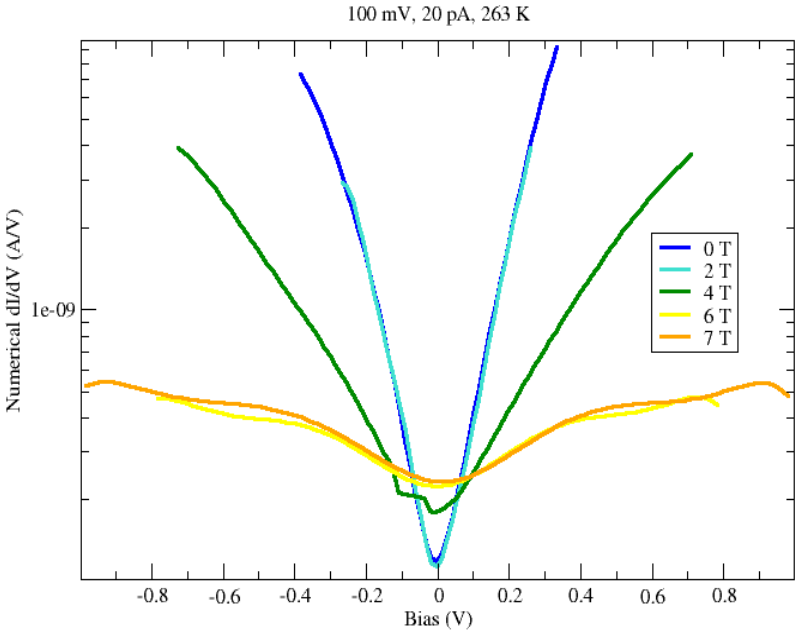






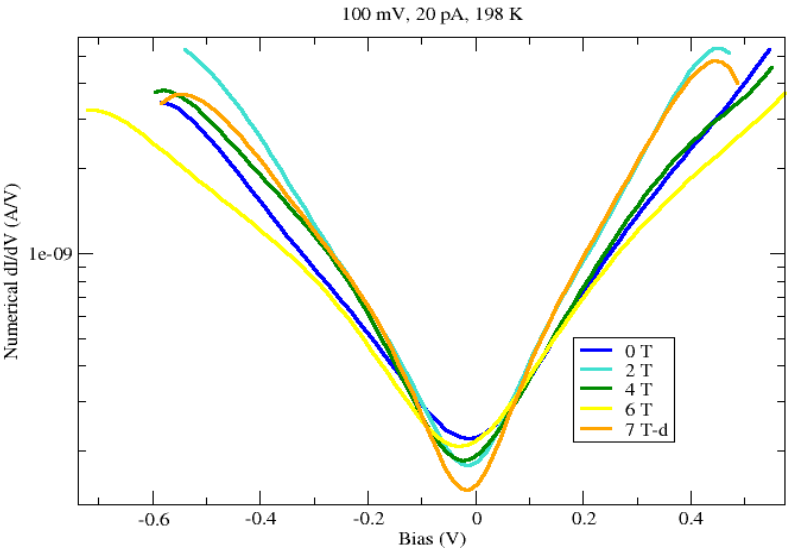


Spectroscopy: magnetic field dependence

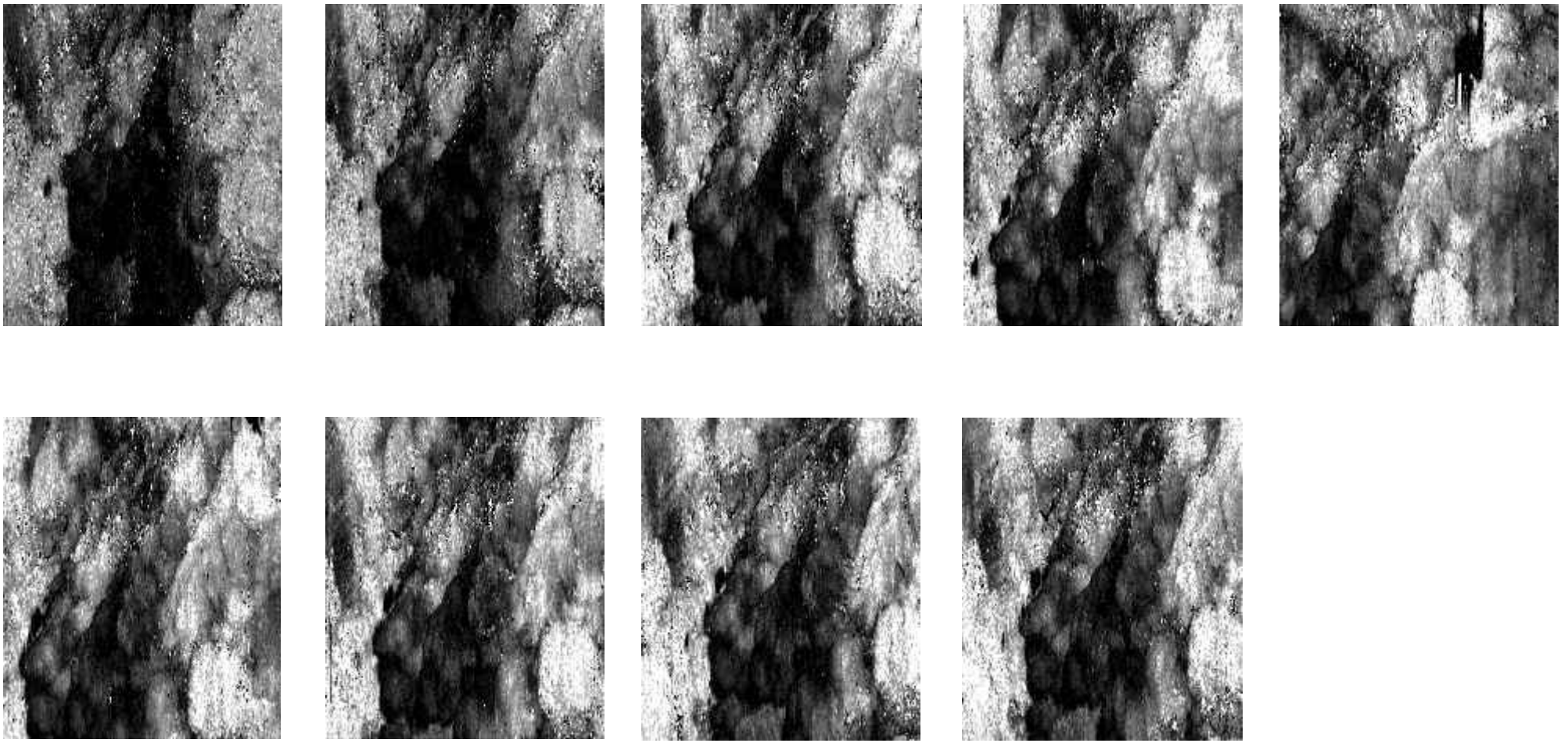


263 K

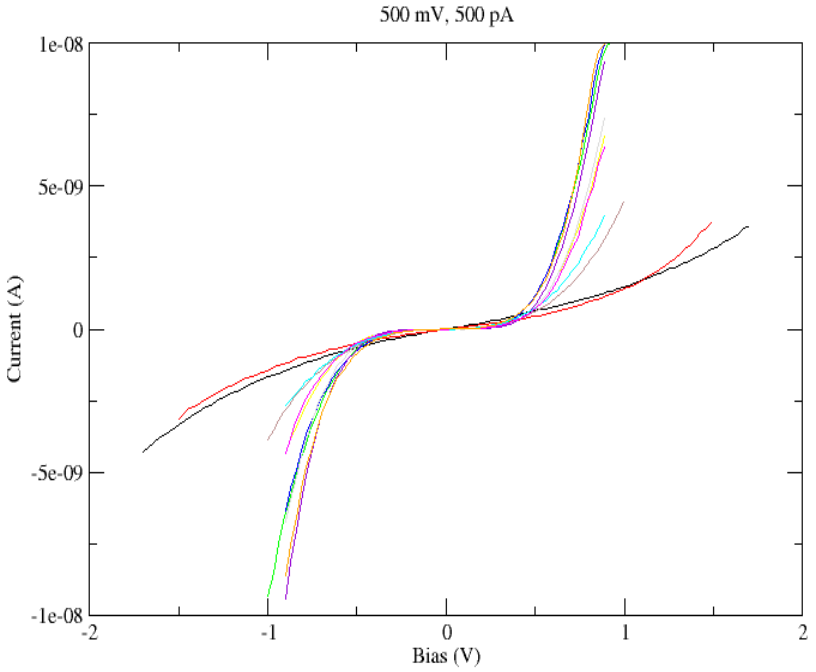
198 K



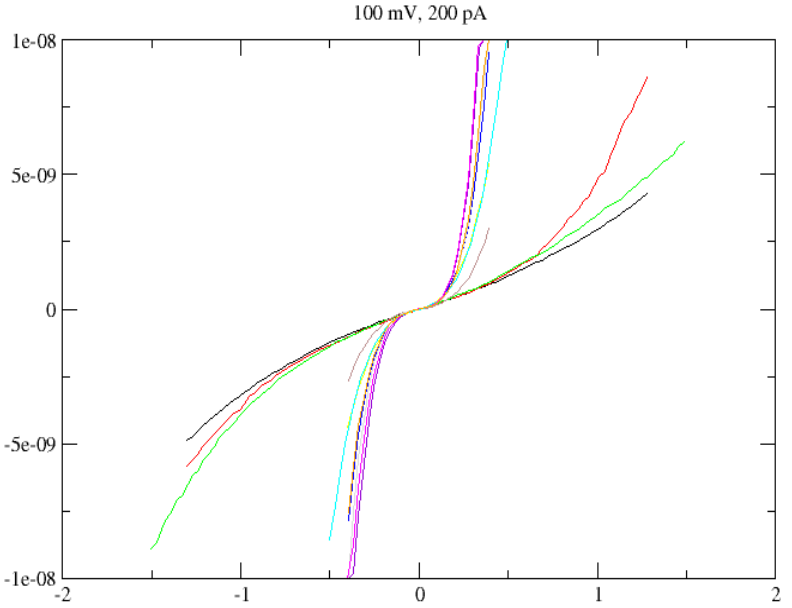
LC-MAP: magnetic field dependence (263 K)



Spectroscopy: another temperature dependence, in one day, never retract (drift => impossible to remain on the same spot).

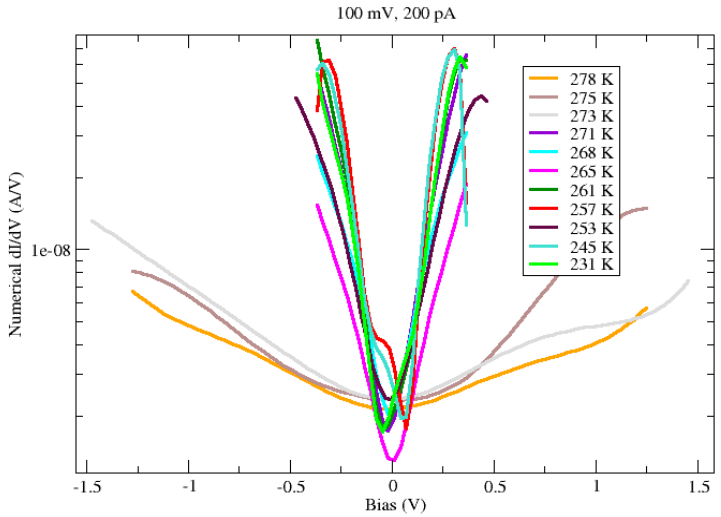


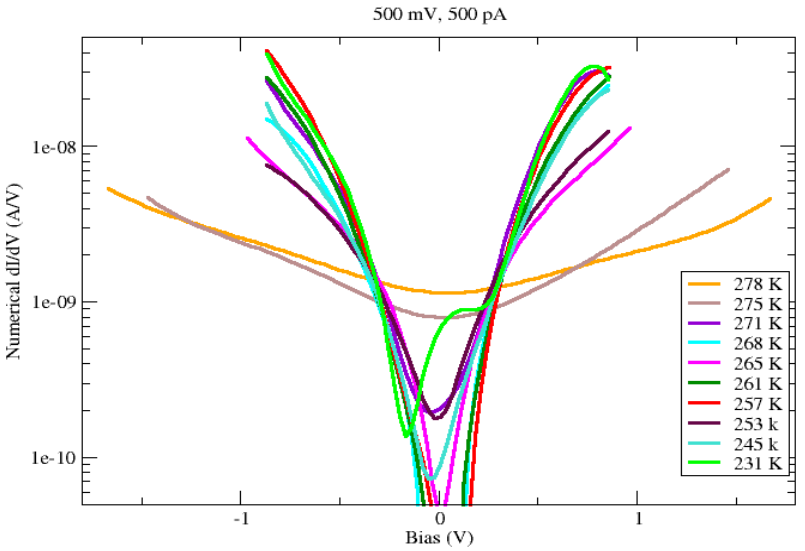
500 mV, 500 pA (1 GOhm)



100 mV, 200 pA (0.5 GOhm)

Spectroscopy: another temperature dependence, in one day, never retract (drift => impossible to remain on the same spot).





0. MI seen in the IV curves and zero-bias conductivity

1. the MI transition appears broad

2. IV-curves and LC-MAP show inhomogeneities

3. contrast tuning by changing the height

TODO:

- some more field dependences

- some more LC-MAPS in the transition

- R vs T, M vs T, X-ray, AFM