

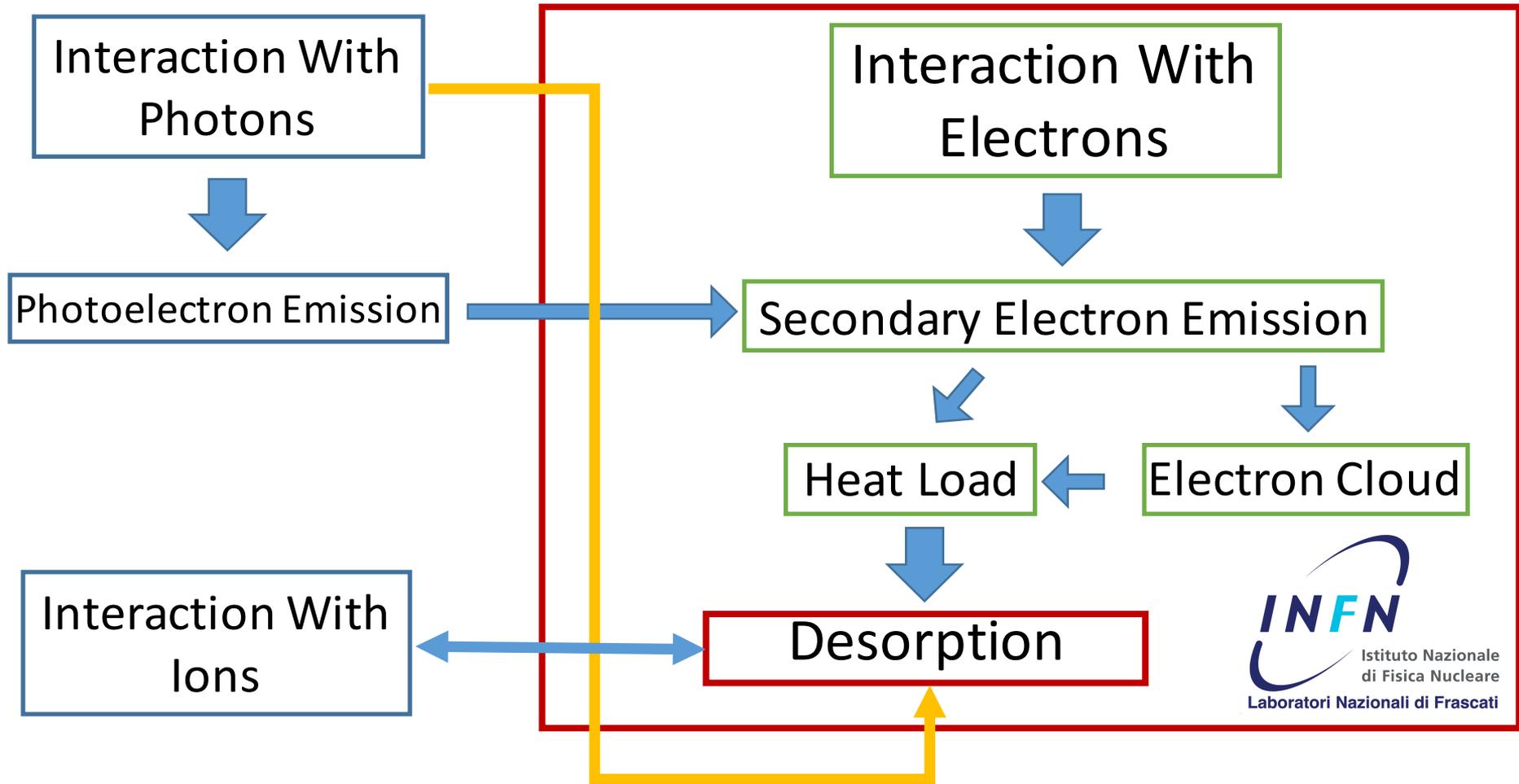


Study of vacuum stability at cryogenic temperature

Attività in corso ai LNF

Marco Angelucci

Vacuum Stability

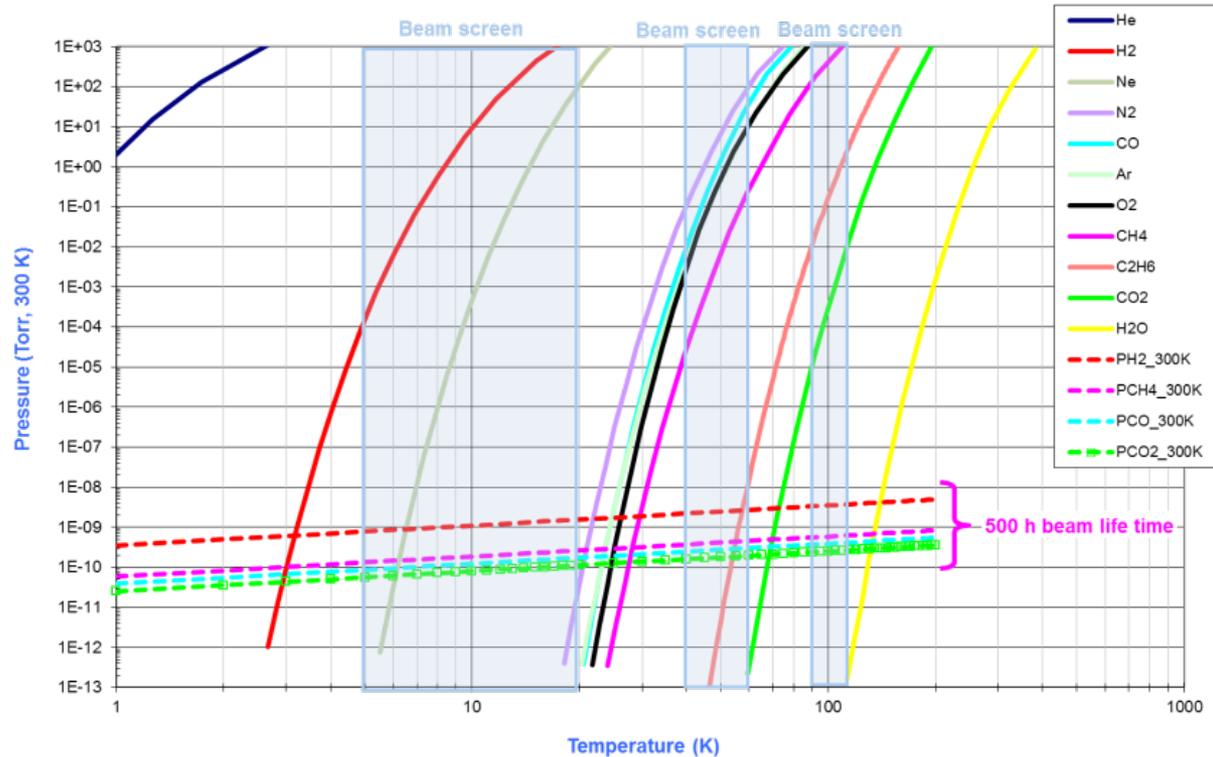


Working Pressure $(<10^{-11})$ \longleftrightarrow BS Temperature Range

LHC
SR Power = 0.13 W/m

FCC
SR Power = 30 W/m

Saturated vapour pressure from Honig and Hook (1960) (C2H6 Thibault et al.)



- Surface Quality

- Adsorbed Gases and molecules

- Secondary Electron Yield
- X-Ray / UV Photoemission

- Cryogenic temperature
- Gas/Molecules Deposition/Desorption

Two Different Ultra-High Vacuum Systems equipped with:

- Low Energy Electron Diffraction
- Secondary Electron Yield Spectroscopy
- Surface Preparation
- Gas-Line

- X-Ray Photoemission
- High Temperature Manipulator

- UV Photoemission
- Low Temperature Manipulator (≈ 8 K)

Raman Spectroscopy

Scanning Tunneling Microscopy

Gas-Line



HT Manipulator



LT Manipulator



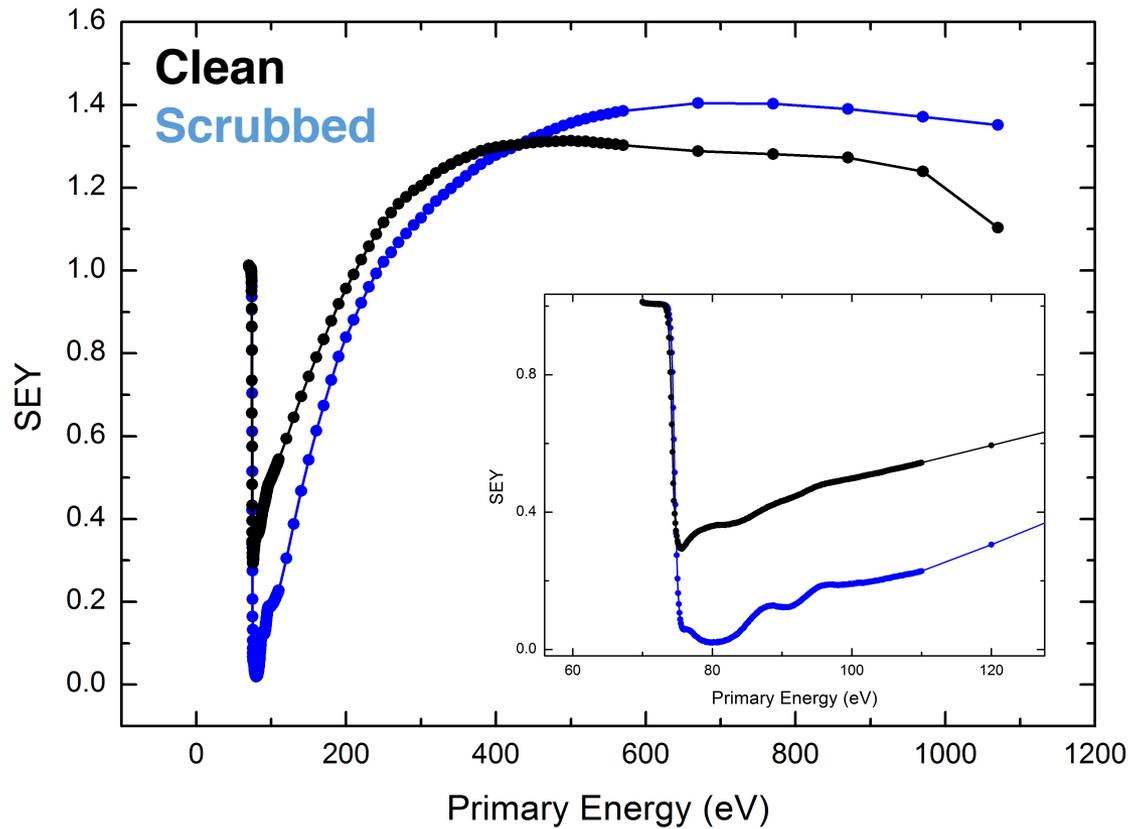
LT STM



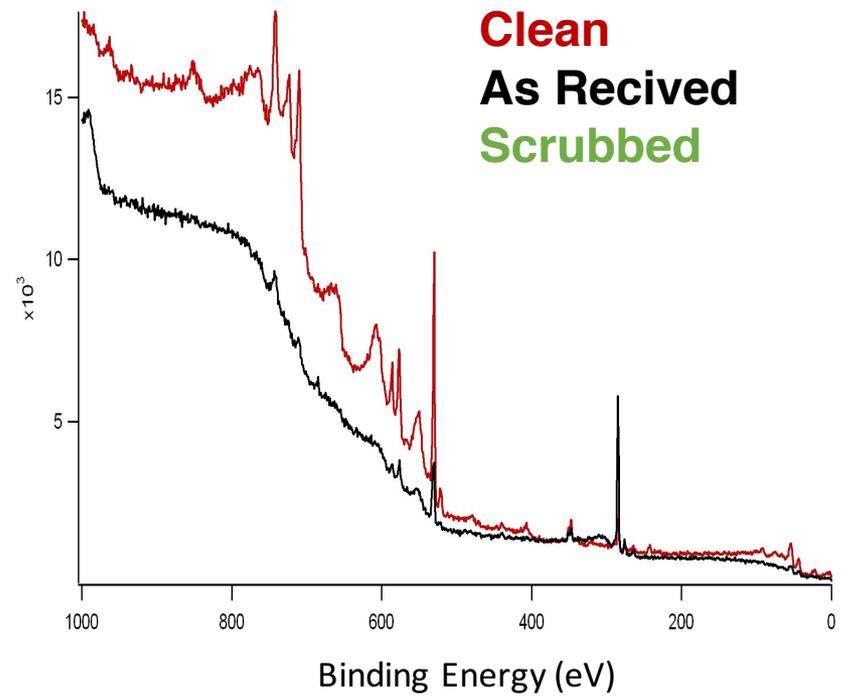
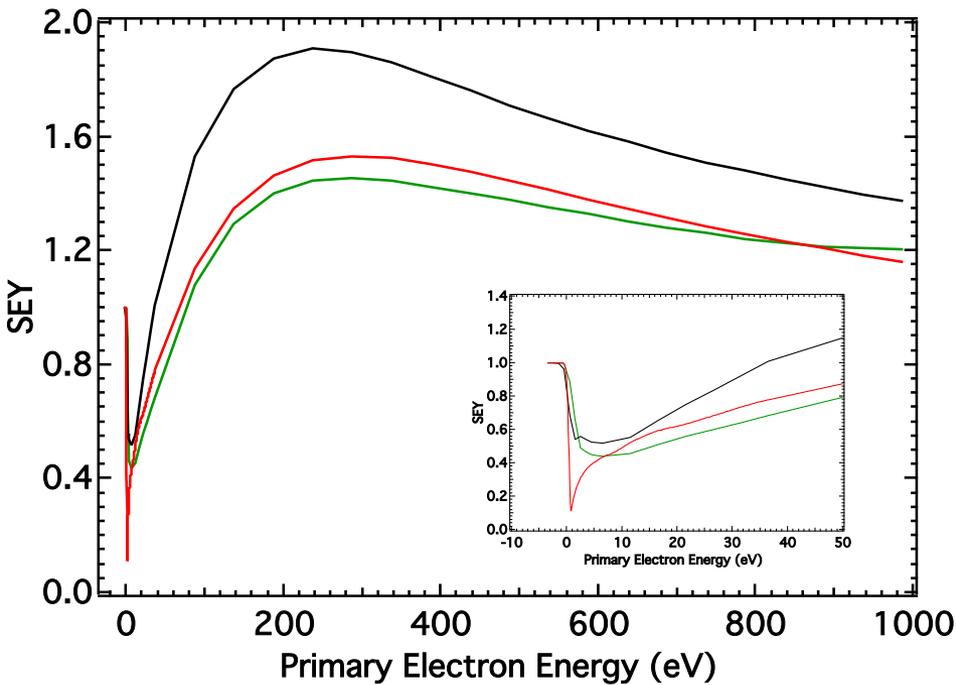
First Results

- Studies of Secondary Electron Yield (SEY) of Different Metals (Cu, Al, Stainless Steel, ...)
- SEY variation before and after **cleaning** and **electron scrubbing** procedures
- Gas (Argon) deposition at low temperature

Copper



Stainless Steel



Future Activities

- Different Gas deposition (CO, CO₂, CH₄ ...) (pure and mixture)
- Coating
- Thermal Programmed Desorption (TPD)



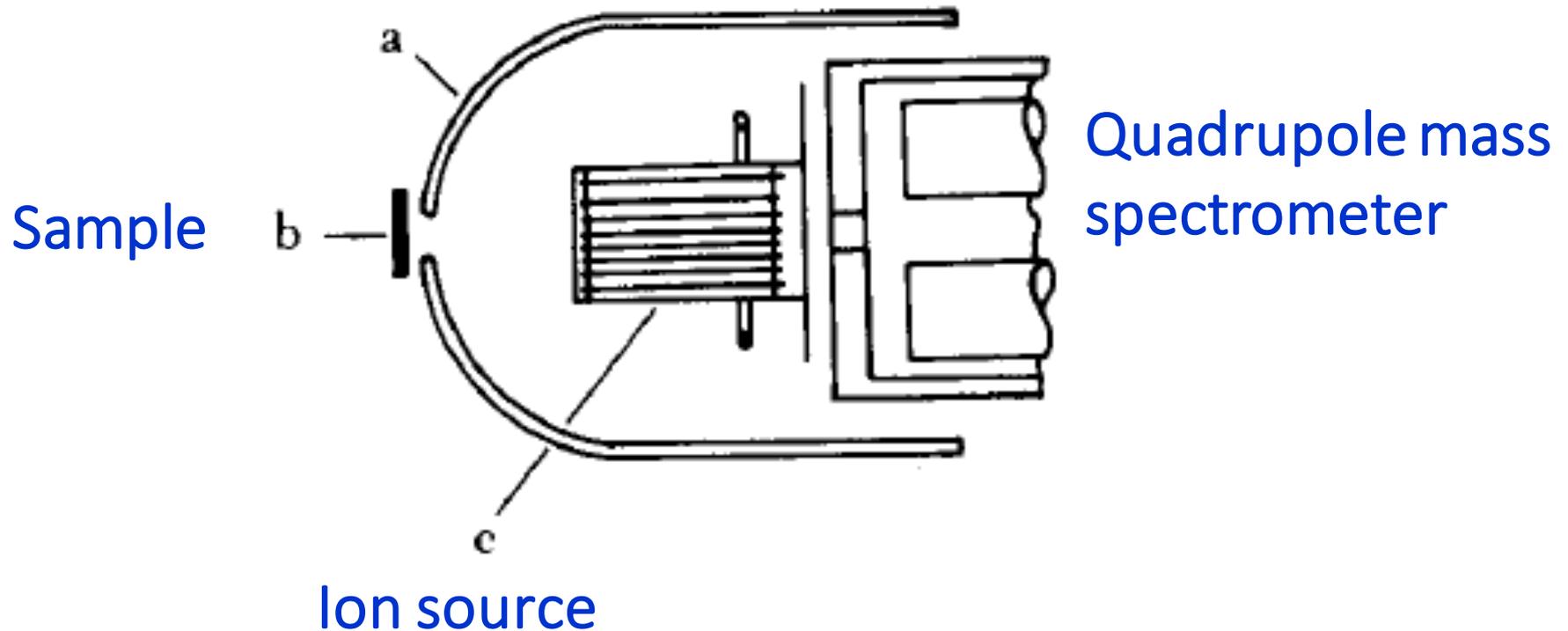
- High Precision Temperature Control
- High Precision Coating System



LNf Lab Upgrades

- Upgrade Gas-line on low temperature system
- Upgrade first manipulator for TPD
- Upgrade second manipulator for Low Temperature Measurements

Glass cage



Feulner, P.; Menzel, D. J. Vac. Sci. Technol. 1980, 17, 662–663.