

# W. Helmholtz

(B.E. Fischer, S. Metzger,  
MRS Bull 25, 39-42 (2000))

Picture produced with  
Kr-ion lithography



# Spectrometers for studies of slow HCl-surface interactions

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Multi-electron dynamics, leading to neutralization of HCl

## What are the well-known steps?

- Initial electron capture
- The final Auger or X-ray deexcitation processes

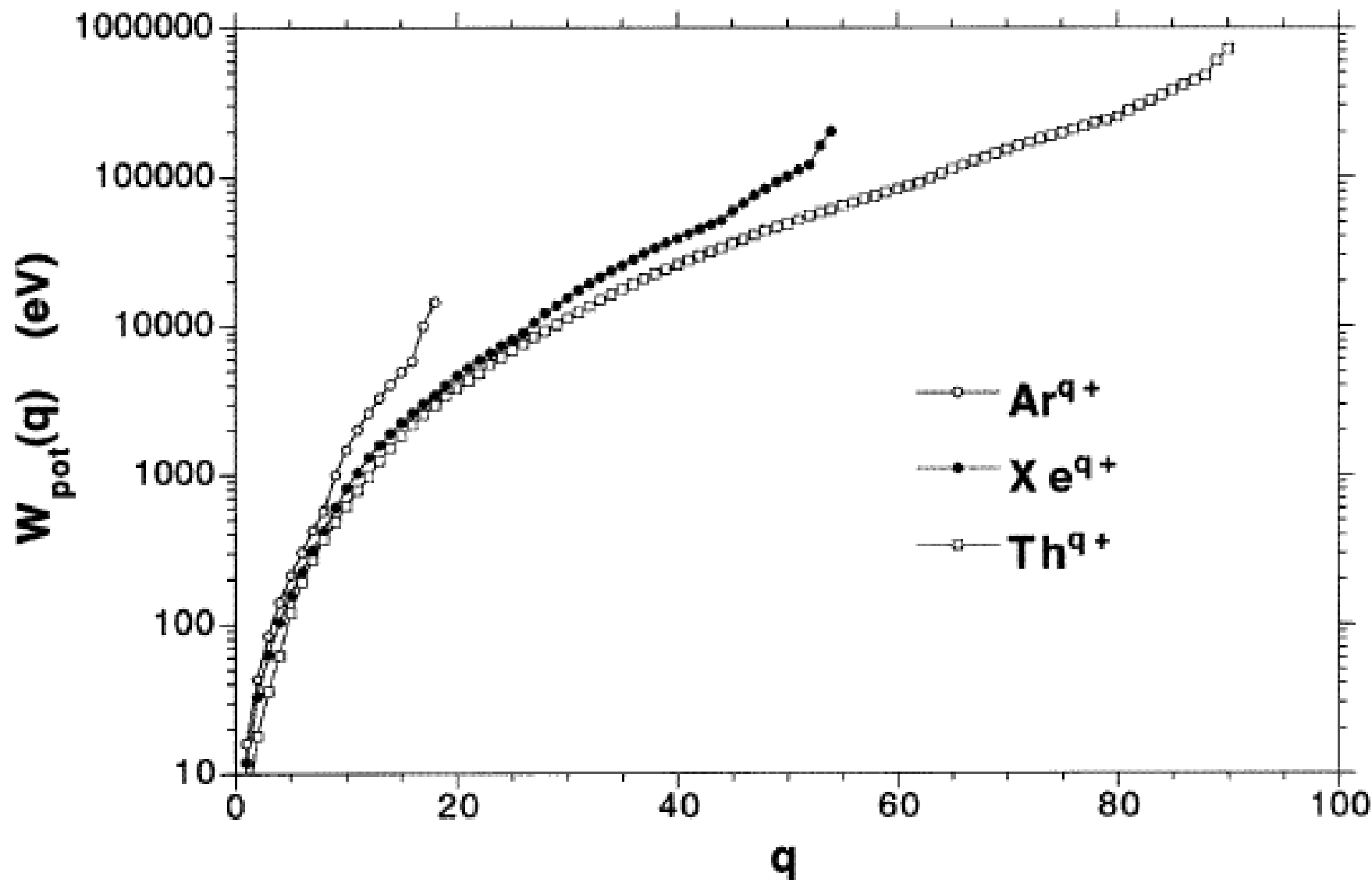
## What is still unknown or speculation?

- The intermediate relaxation dynamics (cascades)

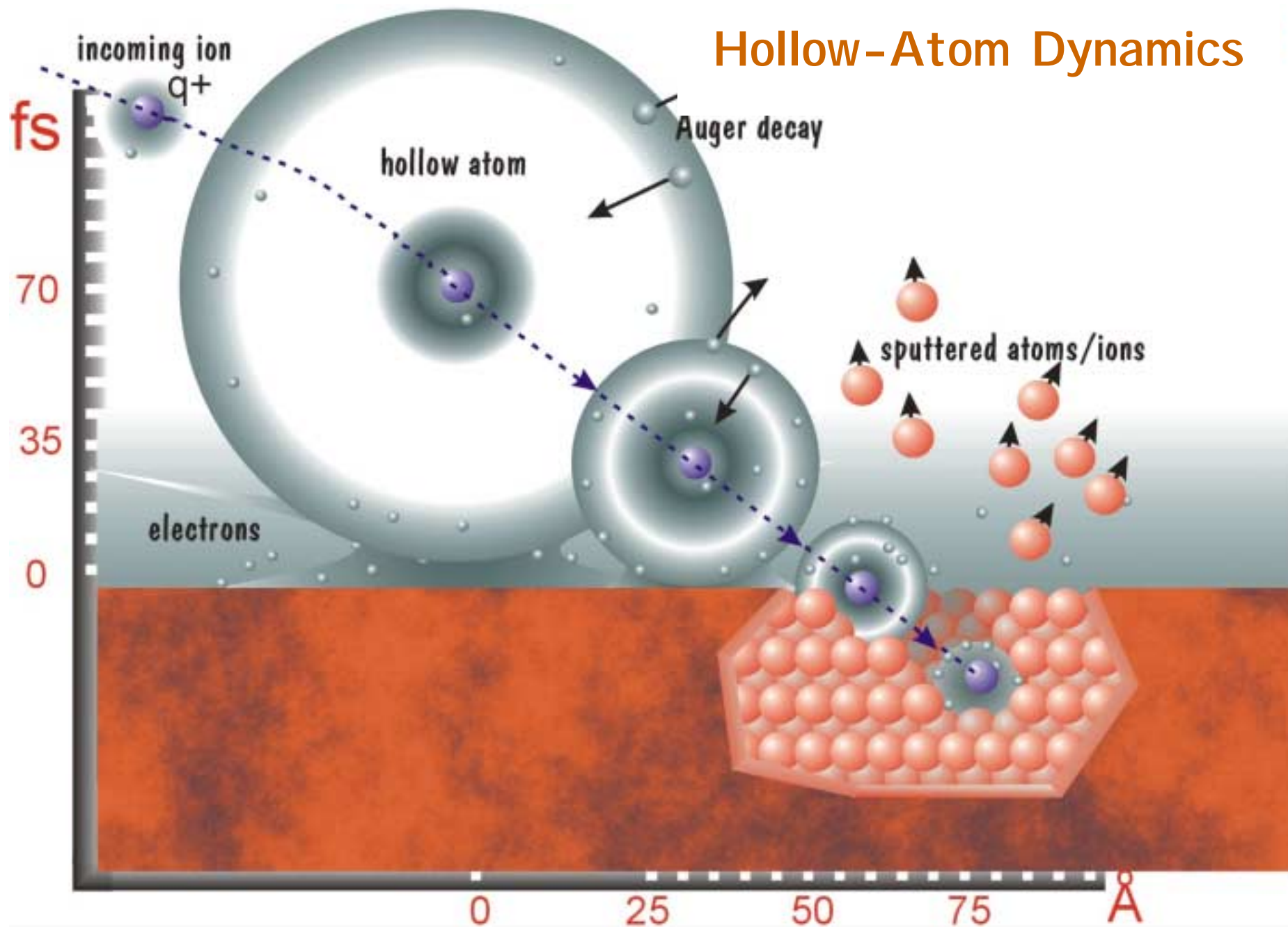
## What kind of spectrometers can help to shed new light on that?

- Electron- and X-ray spectrometers

# Potential Energy of HCl as a function of charge

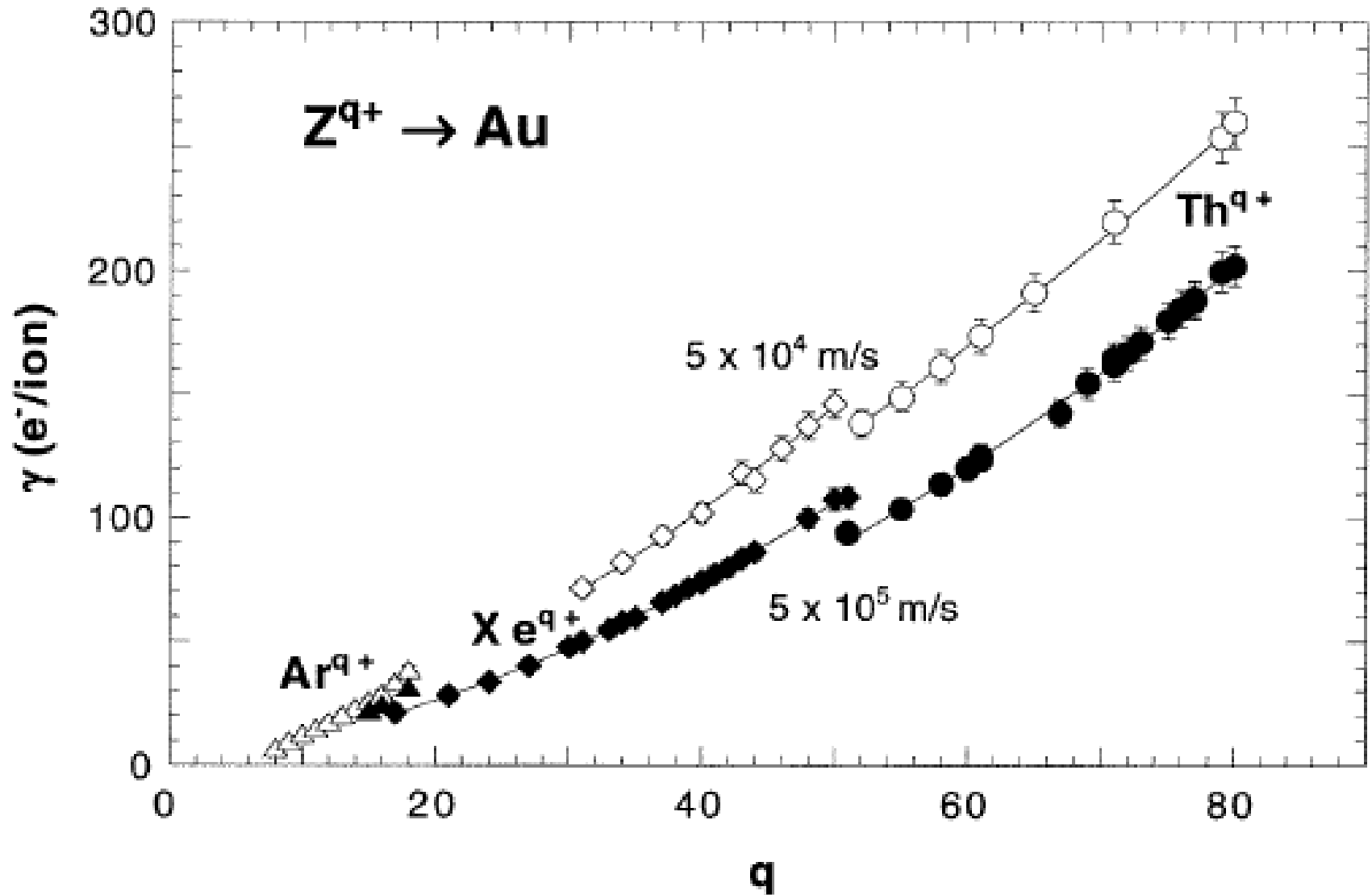


# Hollow-Atom Dynamics



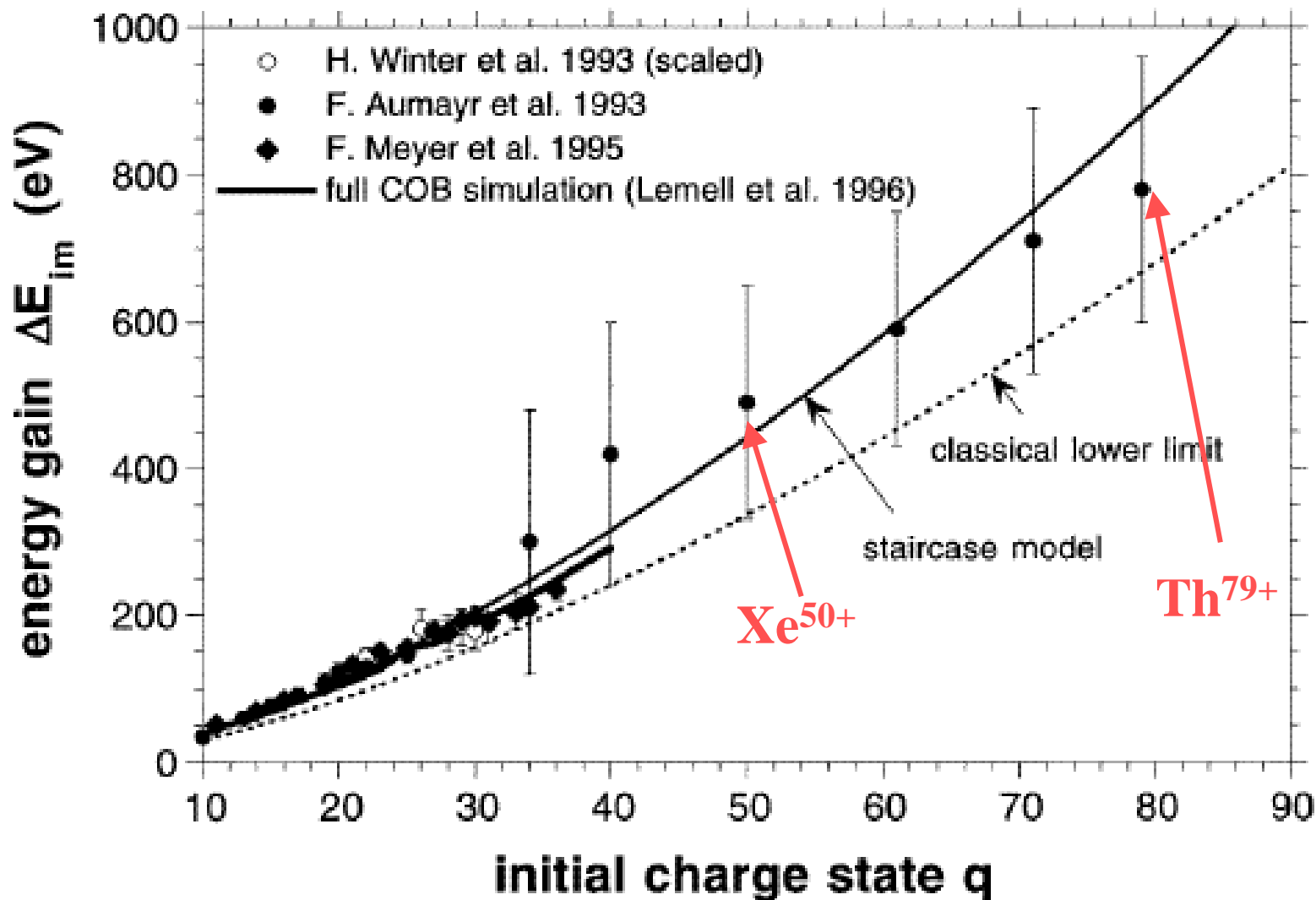
# HCI-induced electron emission from a Au surface

Kurz et al PRA 49, 4693 (1994)



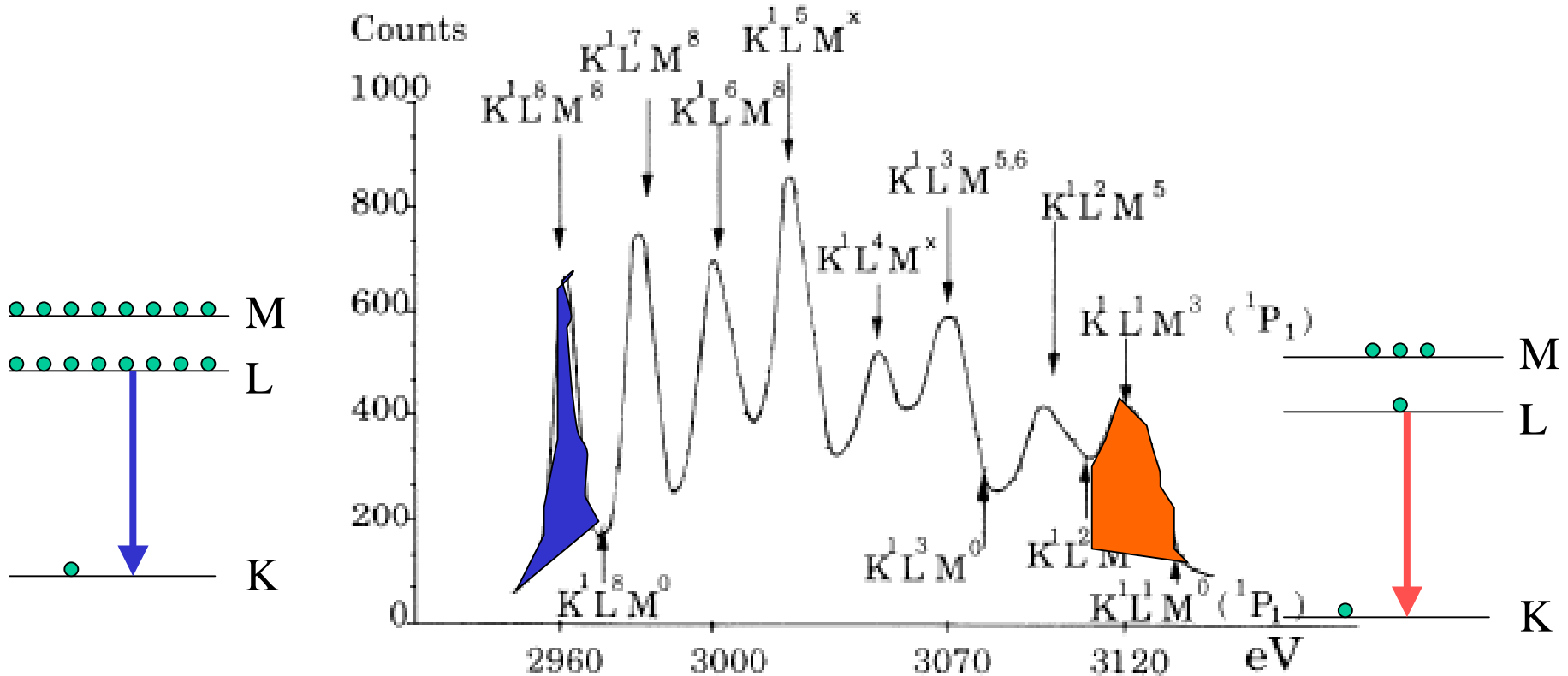
# Energy gain of $Z^{q+}$ ions, approaching a Au surface

HP.Winter and F. Aumayr, J.Phys.B.32 (99) R39

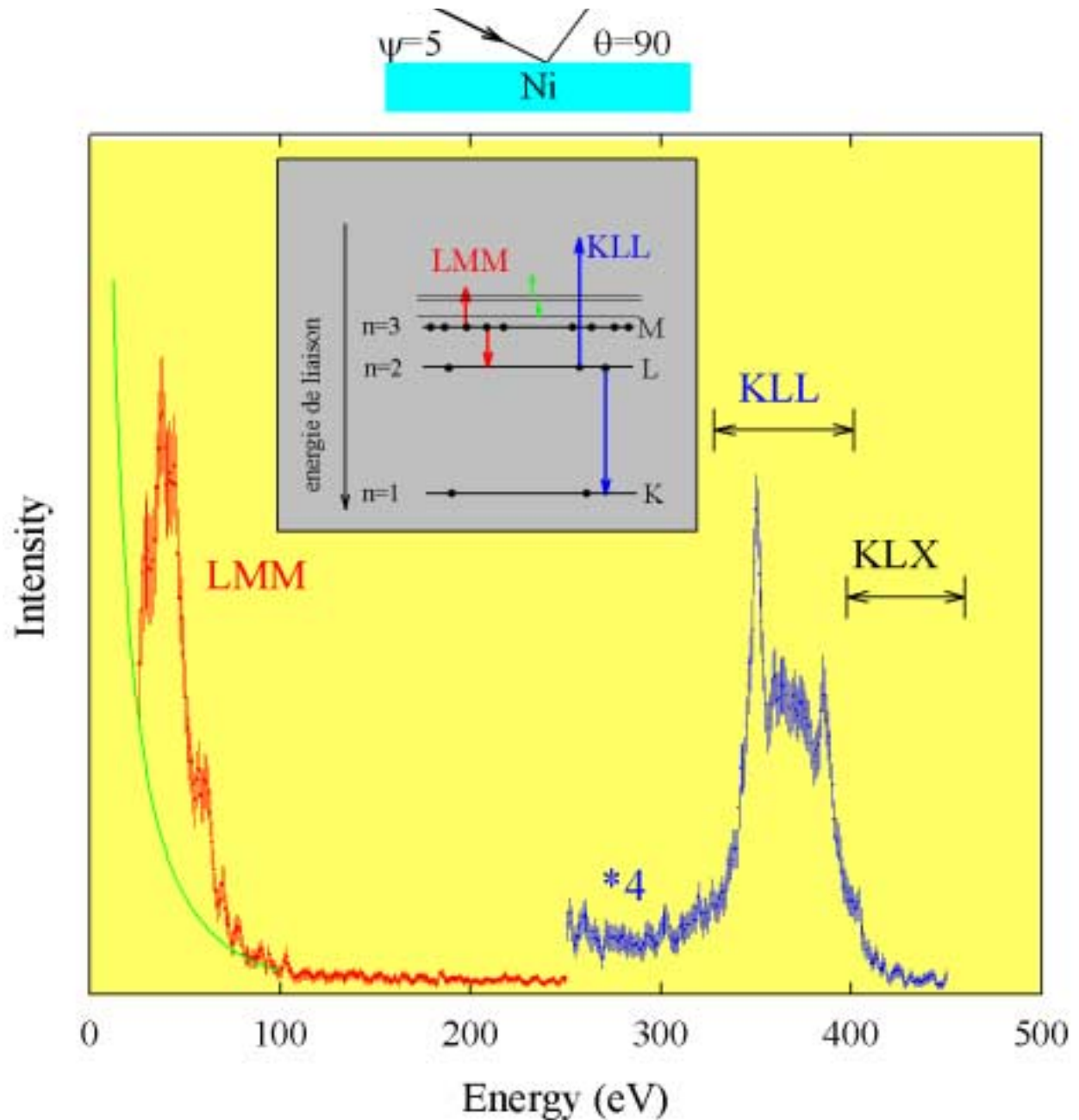


# X-ray spectrum of (2p-1s) transitions in Ar resulting from 340 keV collisions of $\text{Ar}^{17+}$ on a Ag surface

Briand et al. Phys.Rev. Lett. **65**, 159 (1990)

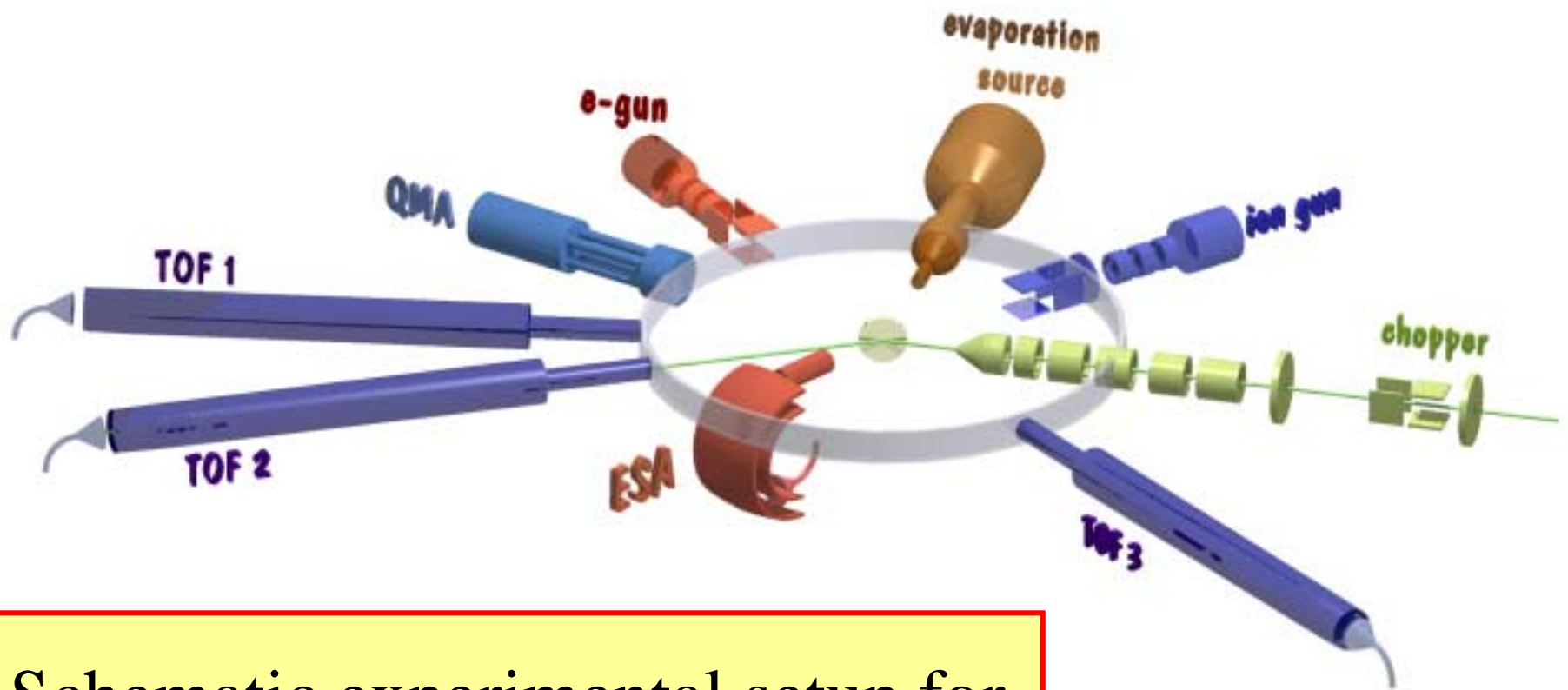


Typical  
Auger-electron  
Spectrum  
resulting from  $N^{6+}$   
collisions on Ni



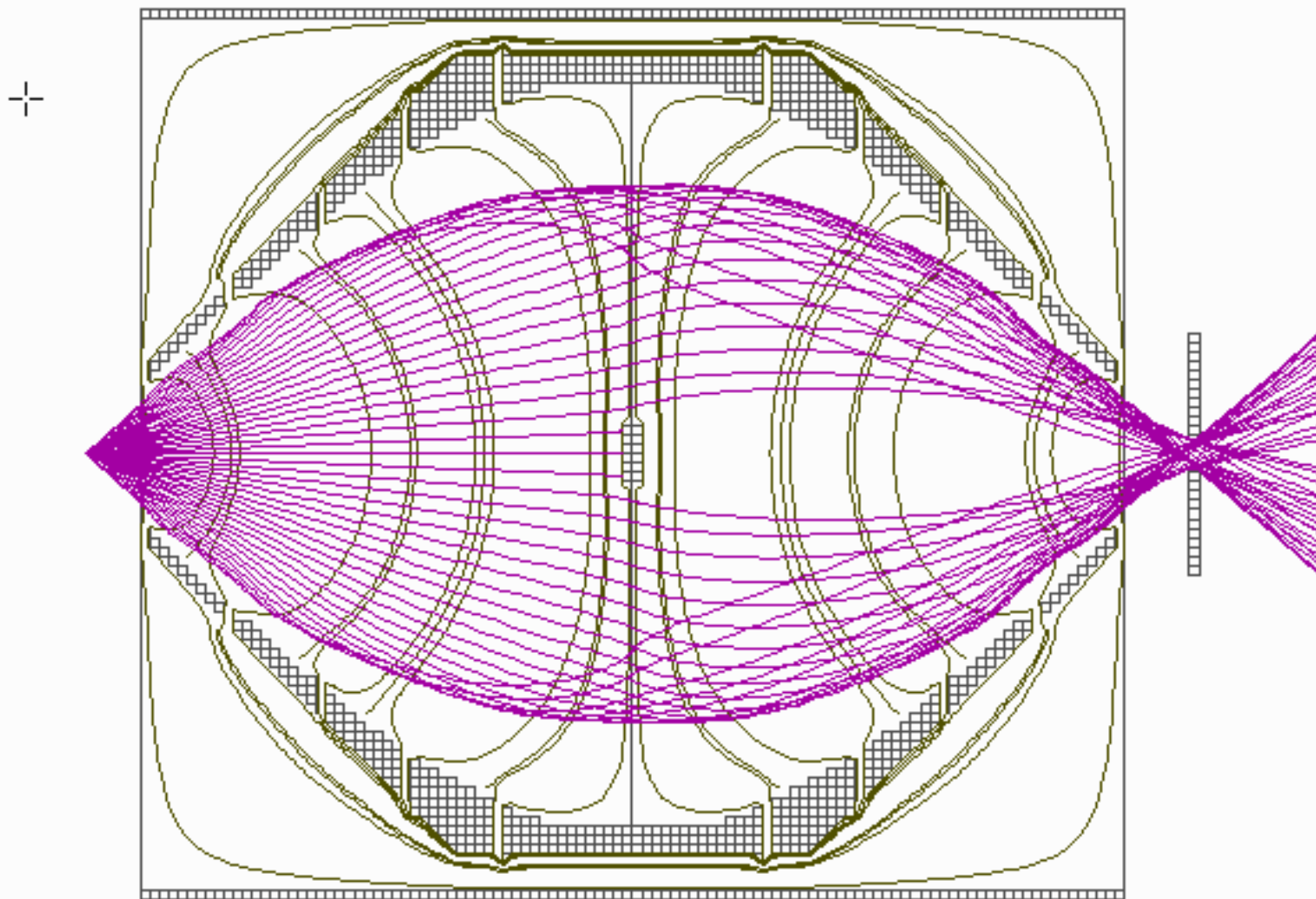


# Sirφ



Schematic experimental setup for  
HCI-surface interaction studies

# Electron spectrometer with high angular acceptance (1.6 Sr)



Mikoushkin et al., Ioffe Institute, St. Petersburg