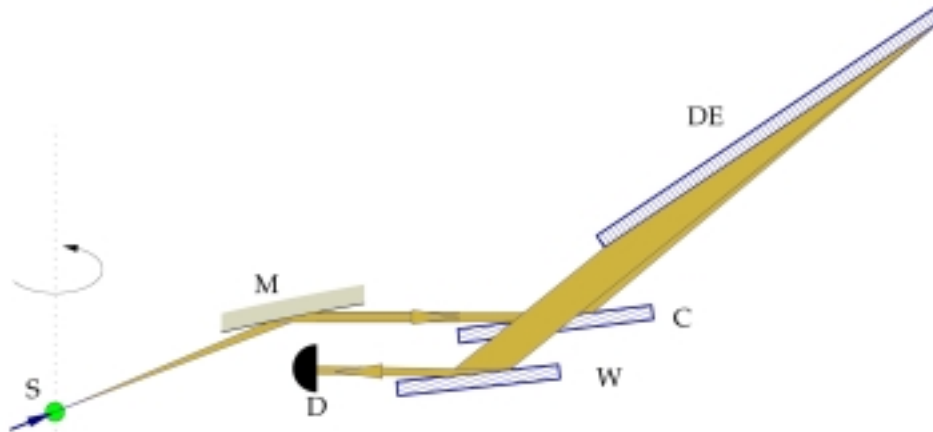


## Proposal of a novel spectrometer for inelastic X-ray scattering with meV resolution

SHVYD'KO Yuri

Universität Hamburg, Institut für Experimentalphysik



A concept of a new spectrometer for inelastic x-rays scattering (IXS) with meV and sub-meV resolution will be presented. The main distinguishing features of the spectrometer are:

1. Spectral properties improve with **decreasing** photon energy. Most optimal performance in the low-energy spectral range  $E \approx 5 - 10$  keV.
2. Applicable even at low-energy synchrotron radiation facilities (including X-FELs).
3. Higher countrates, since undulators produce much more photons in the low-energy range (also at high-energy synchrotron radiation facilities).
4. Variable energy bandpass from  $\Delta E \approx 5$  down to  $\approx 0.2$  meV at a fixed photon energy  $E$ .
5. Peak throughput practically independent of the energy bandpass  $\Delta E$ .
6. Using low-energy photons means better momentum transfer resolution for the same angular acceptance.
7. Proximity to  $K$ -absorption edges of the important transition metals.

Principles and example designs of the spectrometer will be discussed.