

Polarimetry of 0.1 - 130 MeV Electron Beams at the S-DALINAC

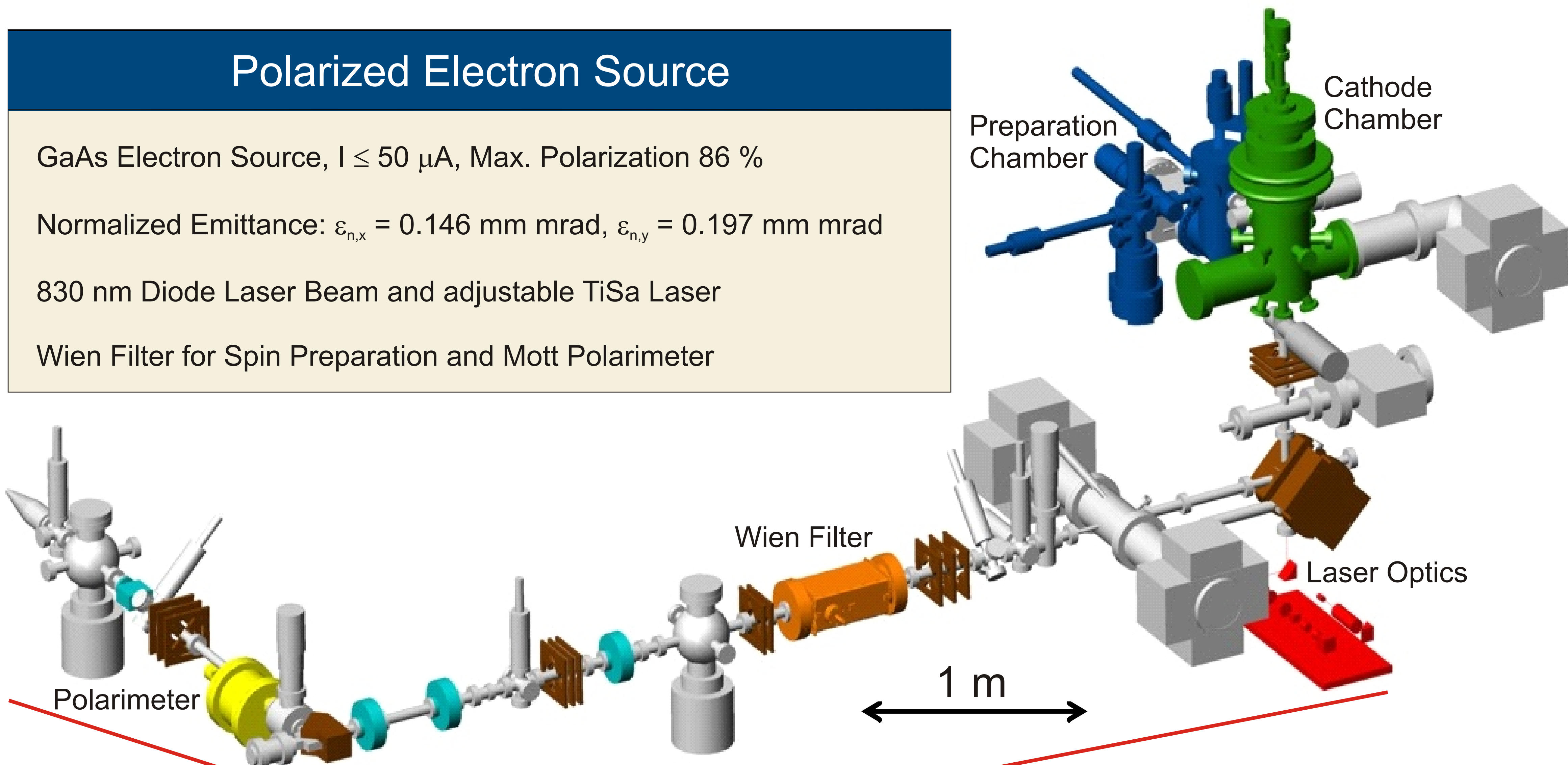


TECHNISCHE
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Polarized Electron Source

GaAs Electron Source, $I \leq 50 \mu\text{A}$, Max. Polarization 86 %
 Normalized Emittance: $\varepsilon_{n,x} = 0.146 \text{ mm mrad}$, $\varepsilon_{n,y} = 0.197 \text{ mm mrad}$
 830 nm Diode Laser Beam and adjustable TiSa Laser
 Wien Filter for Spin Preparation and Mott Polarimeter



Experiments

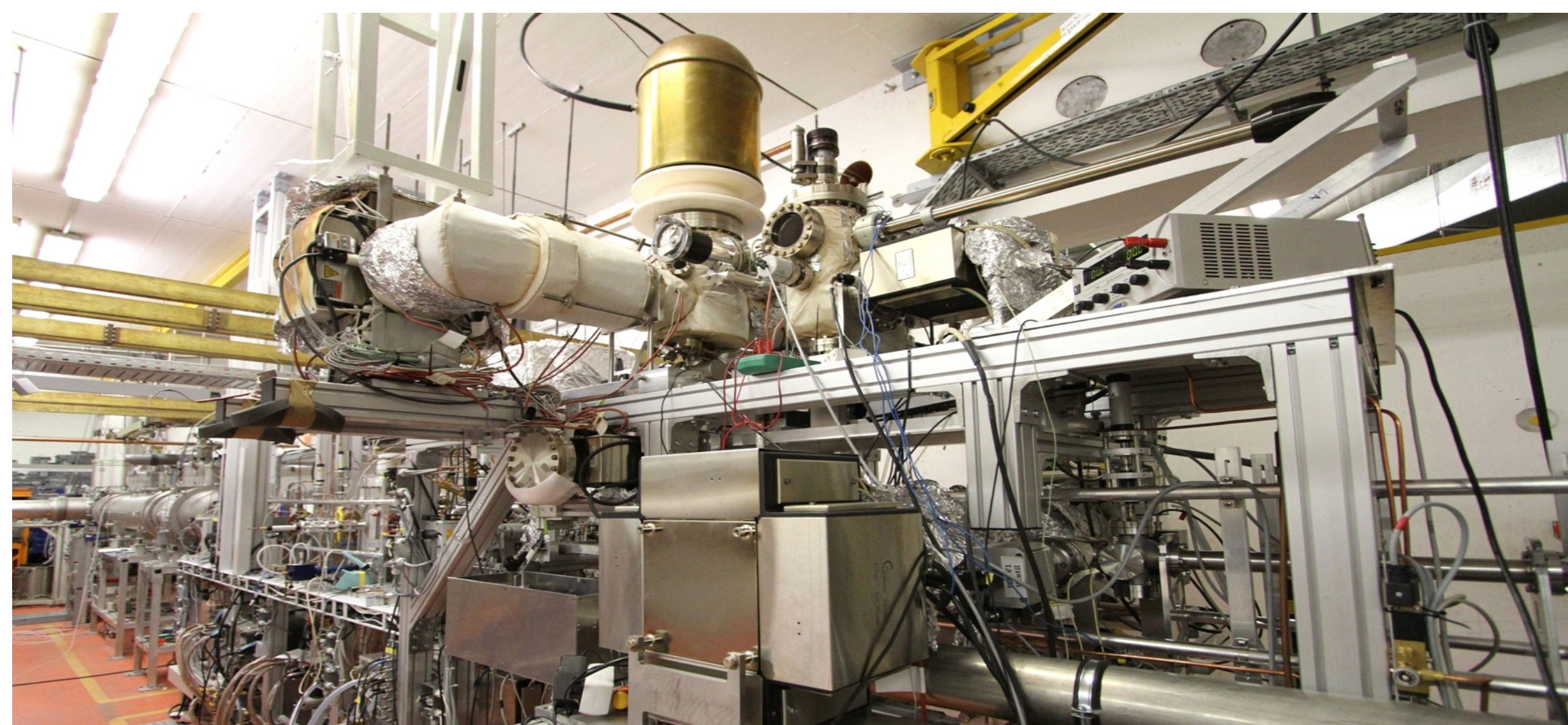
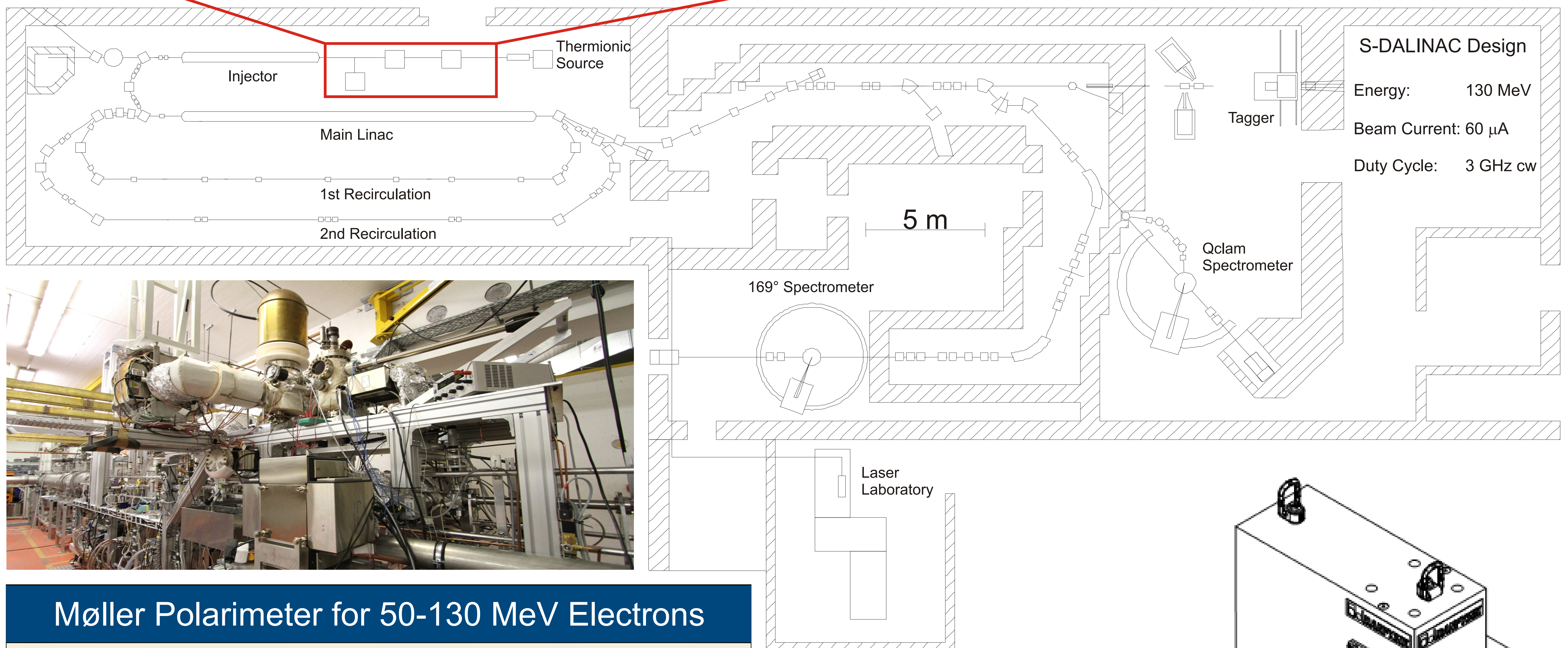
Polarized Electrons & Polarized Photons for Nuclear Structure Studies

Parity-non-conservation in Photofission of ^{238}U , Active Gas Target using UF_6

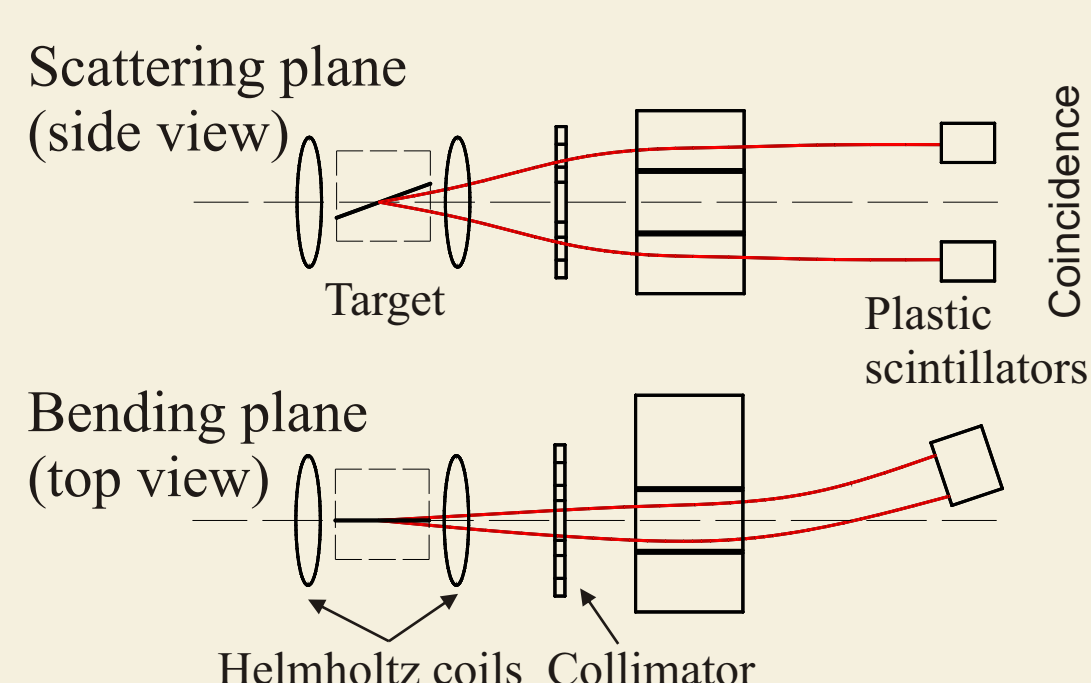
5th Structure Function of the Deuteron at Very Low Momentum Transfer

Parity-non-conservation in Parity-Doublet of ^{20}Ne

3-Nucleon-Force Investigation of the 5th Structure Function in ^3He Breakup Reaction



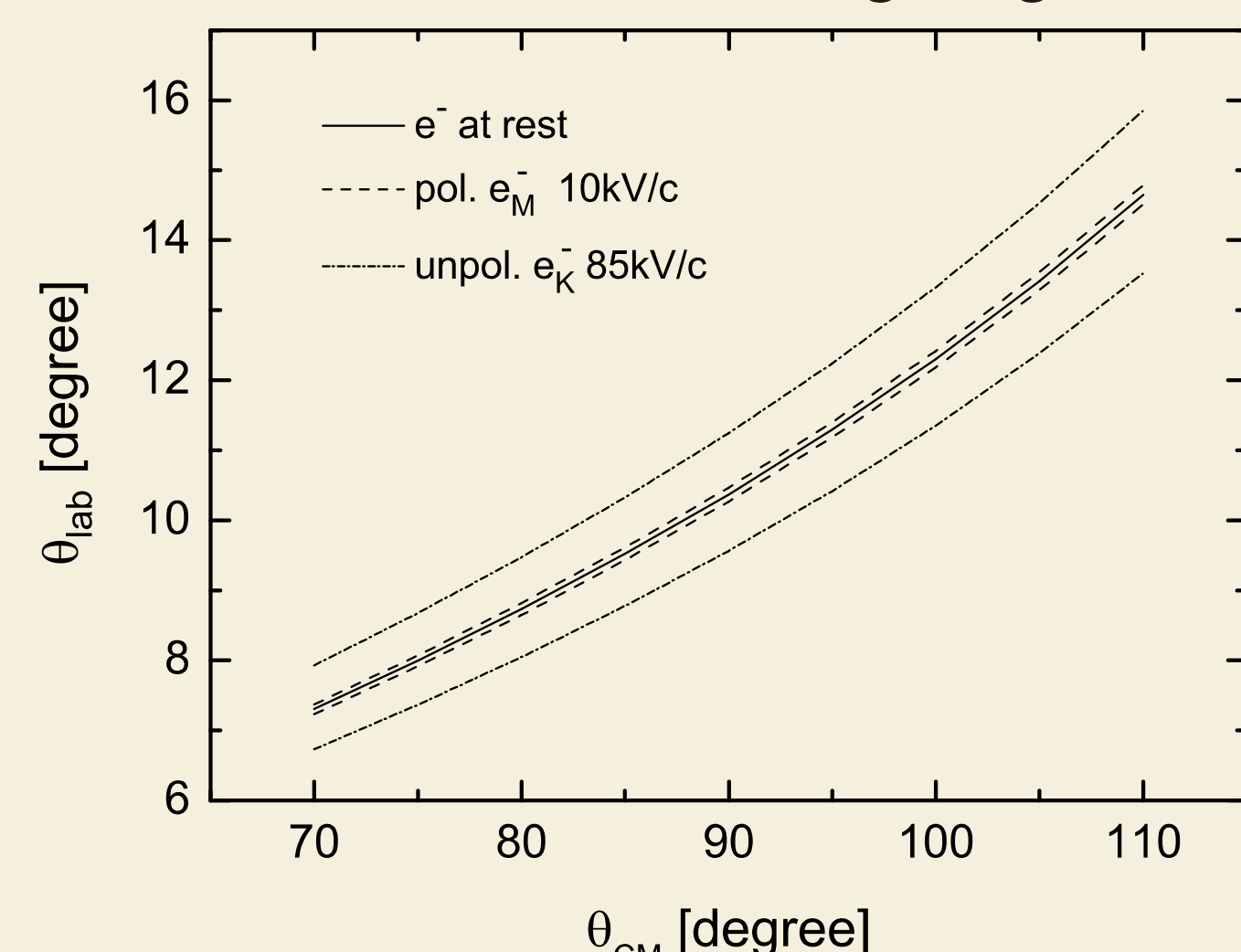
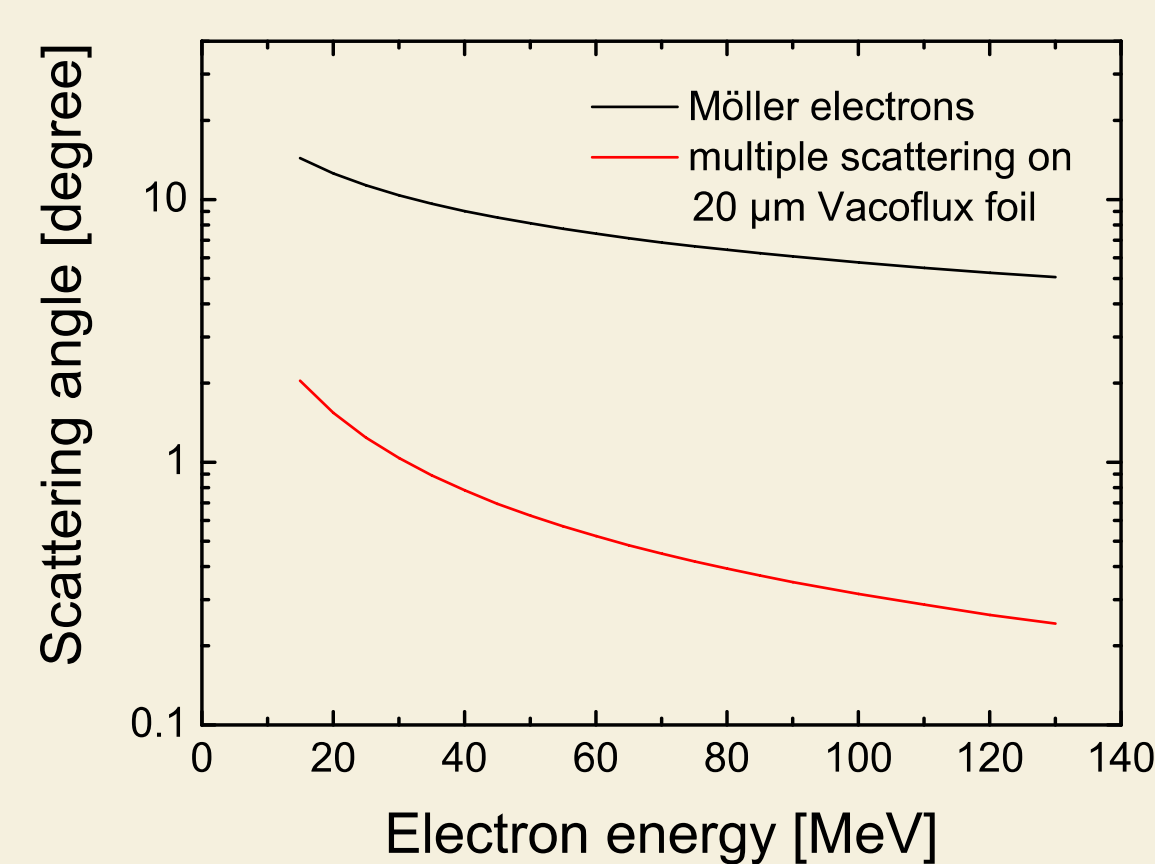
Møller Polarimeter for 50-130 MeV Electrons



Polarization-dependent cross section

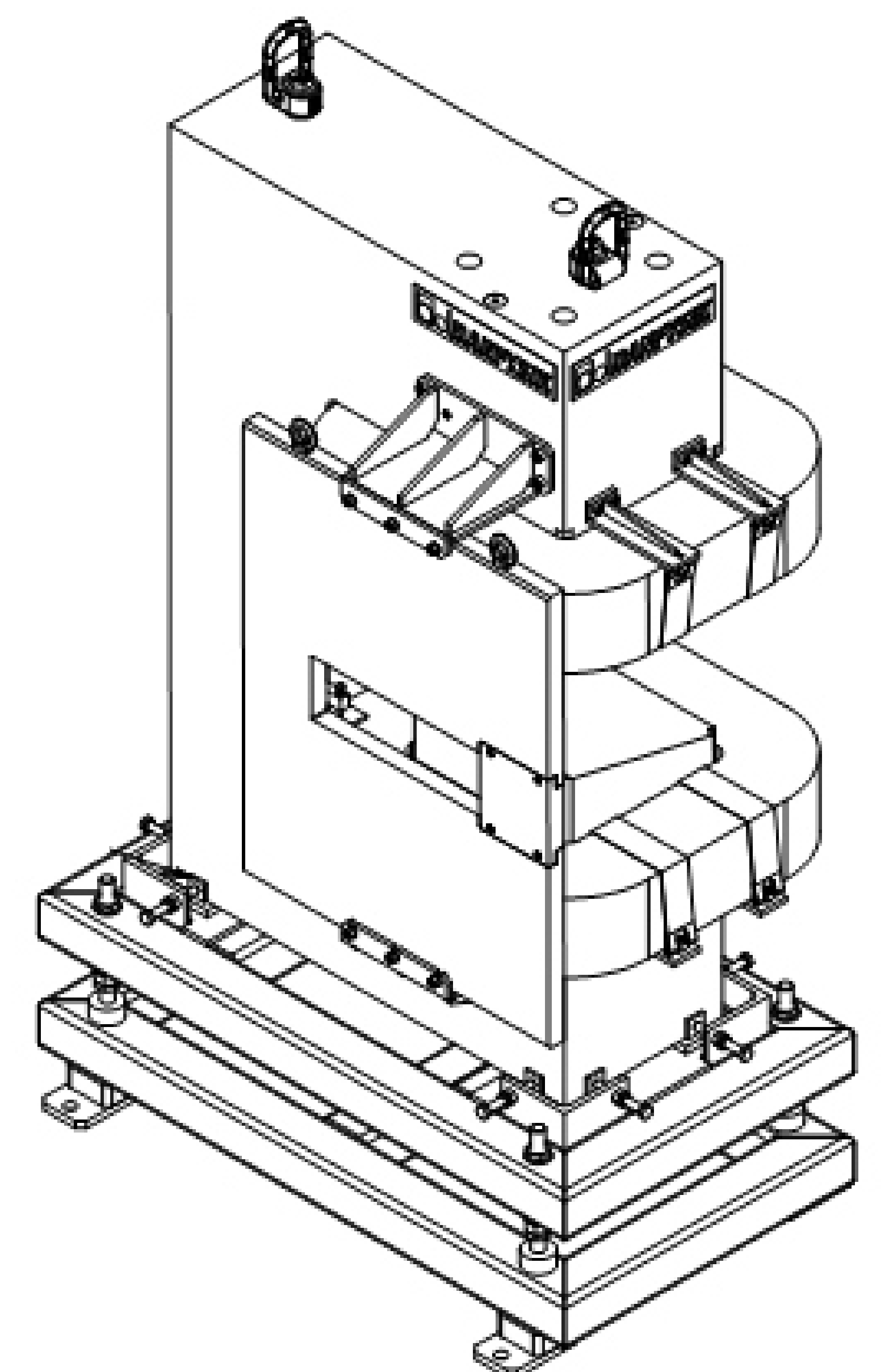
$$\frac{d\sigma}{d\Omega} = \left(\frac{d\sigma}{d\Omega}\right)_{\text{unpol}} \left[1 + \sum a_{ij} P_i^B P_j^T\right]$$

Møller scattering angle



Magnet Design

- Inclined Pole Faces
- 26° Opening Angle
- $B < 10 \text{ mT}$ at Polarized Target
- 256 Turns per Coil
- 150 A, 78 V Power Supply
- 38400 A*t per Coil
- Built by Danfysik



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