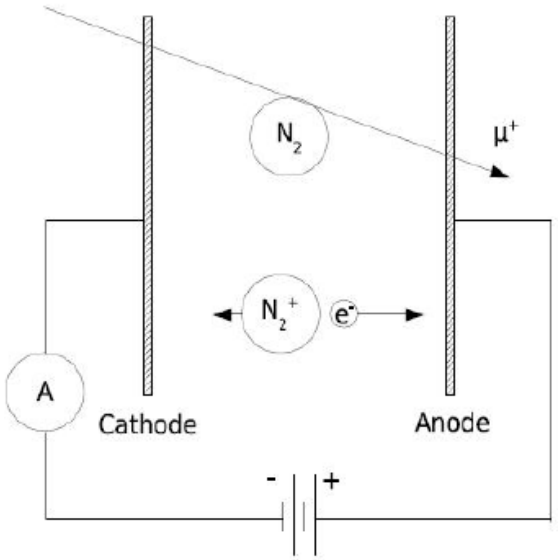
Beam loss monitors

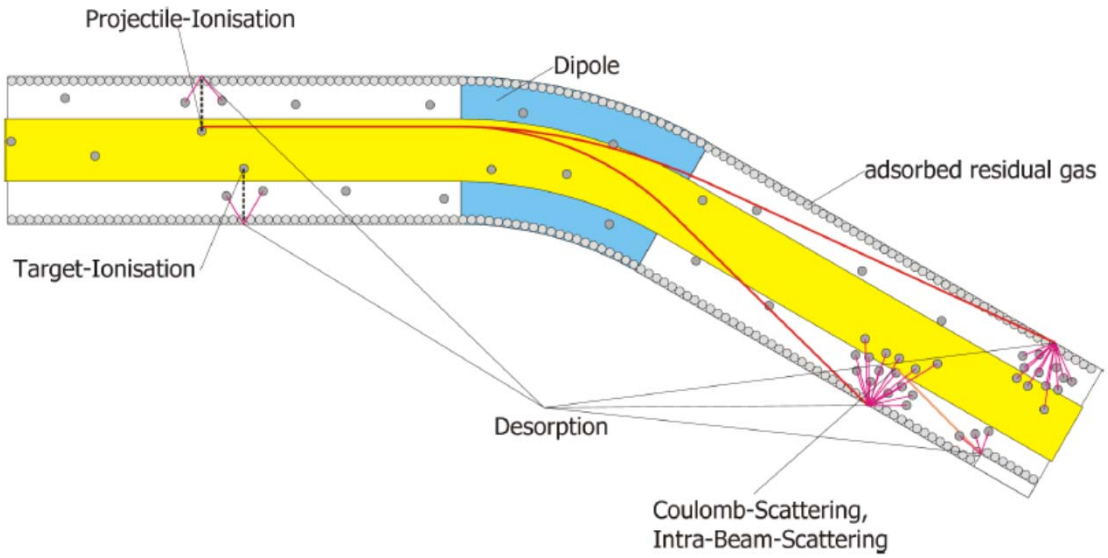


- Beam losses in FAIR synchrotrons → activation
- Response function for p known → SPS Ionization chamber
  Heavy ions, different species → Benchmarking: FLUKA and Geant4 simulation
- LHC Ionization chamber response function
- Real beam-loss experiment

Definition of beam loss scenarios for simulation: SIS18, SIS100

Vladimir Lavrik
Strahldiagnose (GSI)
Institut für Angewandte Physik (Frankfurt Universität)

Dynamic vacuum



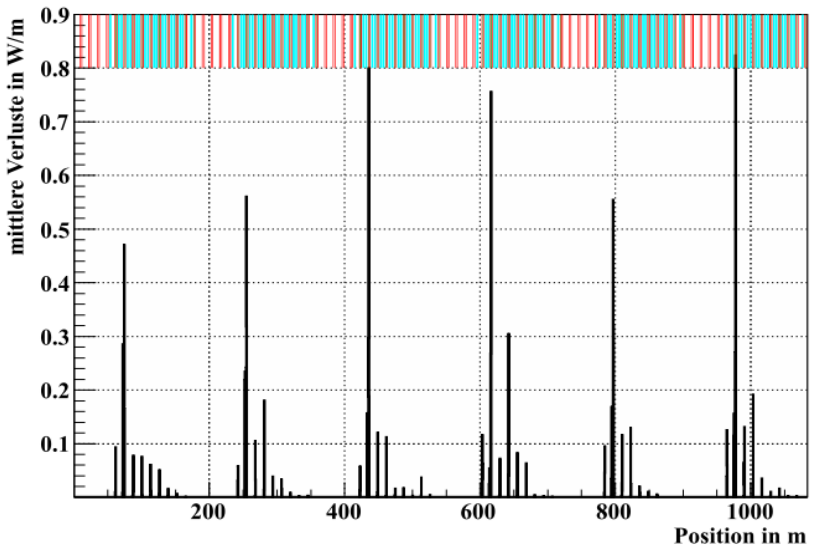


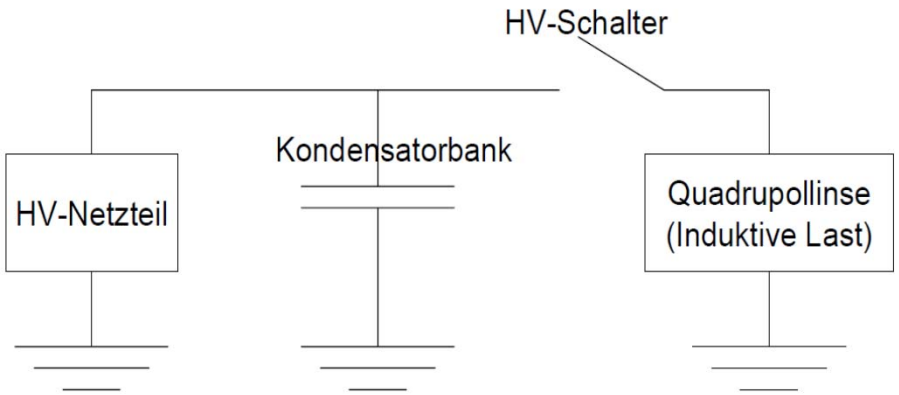
Abbildung 4: Zeitlich gemittelte Verlustverteilungen auf die Wände in W/m des gesamten SIS100 beim Betrieb mit U^{28+} und schneller Extraktion.

- Beam losses due to impact ionization of beam ions with rest gas atoms
- Low rest gas pressure and low desorption rate required
- → Simulation with Strahlsim code
- Hydrogen pressure in SIS100 to high → Cryo adsorption

Determination of sticking coefficients → Strahlsim update

Frederic Chill
Primary beams (GSI)
Institut für Angewandte Physik (Frankfurt Universität)

HV-switches and pulsed quadrupole lenses



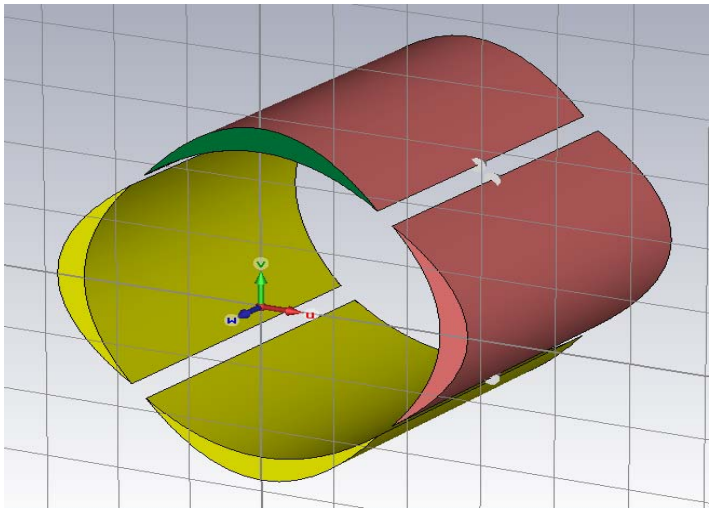
HV- switch for short HV pulses for kicker and magnetic quadrupole lenses

→ Transfer of bunches between synchrotrons

→ electronic network simulations

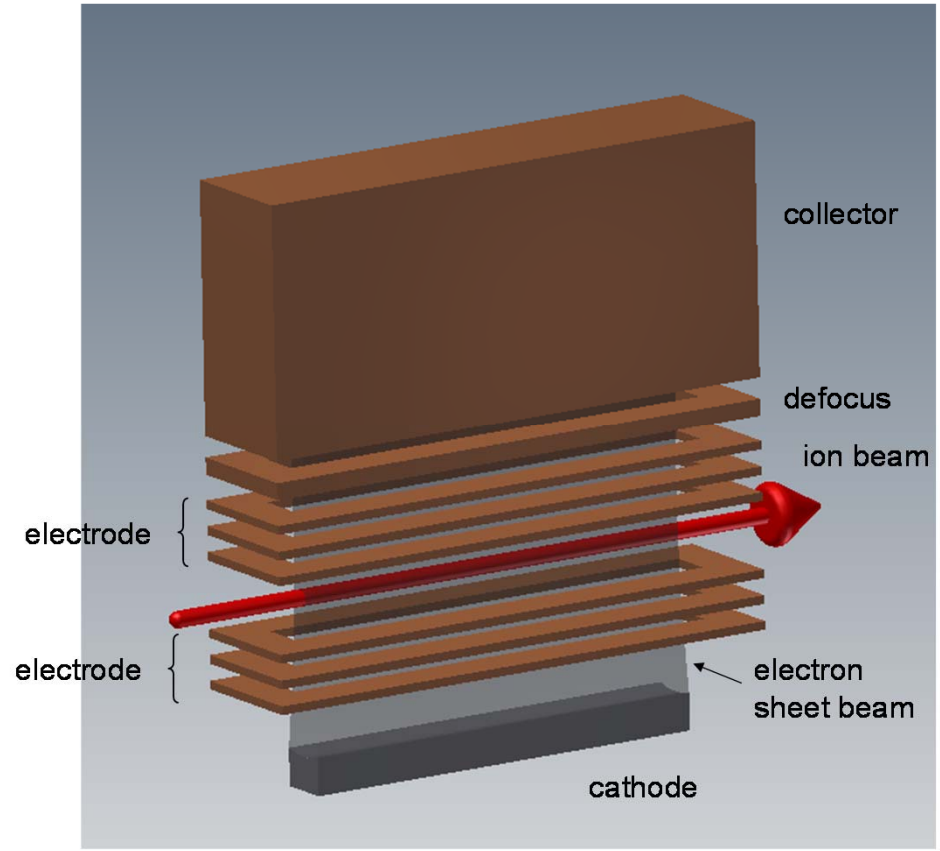
Cos θ set-up of pulsed quadrupole lenses of low inductance (air coils)

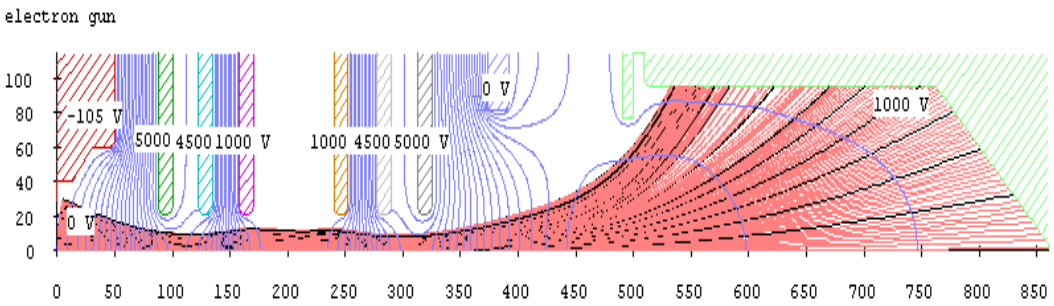
→ current distribution, skin effect
technical lay-out



Carmen Tenholt
Primary Beams (GSI),
Institut für Angewandte Physik (Frankfurt Universität)

Transversal electron target





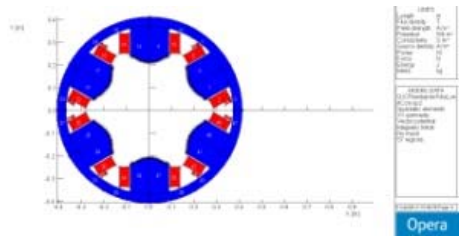
- Ion – electron interaction (cross sections measurements, ionisation, recombination)
- Beam transport and ion sources
- Simple concept, no magnetic field, sheeth beam
- “animated beam technique”
- Under construction

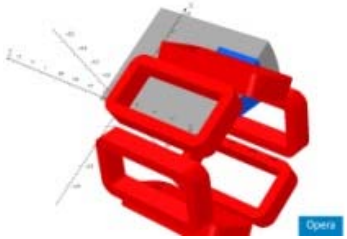
Cooperation with atomic physics department

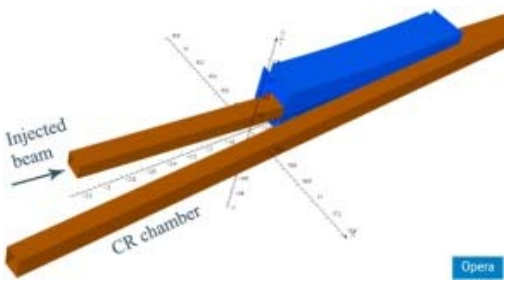
Sabrina Geyer
Institut für Angewandte Physik (Frankfurt Universität)

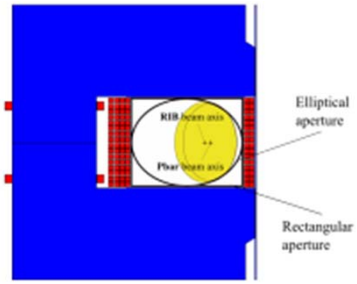
CR injection and non linear field studies ESR

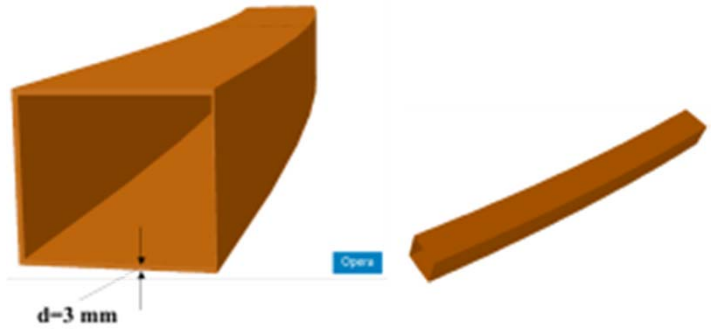
Horizontal/vertical orbit corrector
integrated into the main sextupole











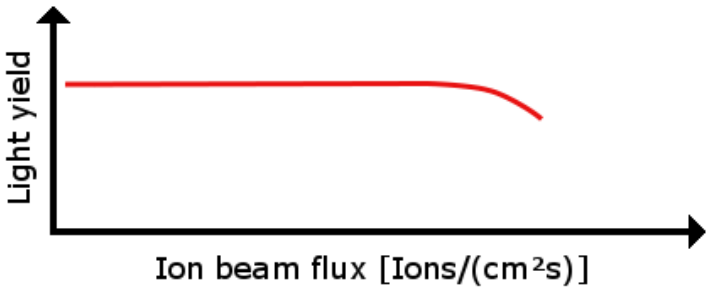
a) Rectangular chamber (3 mm)

- Measurements and optimization of ion-optical properties
- Nonlinear field studies
- Development of the correction methods
- Pulsed injection/extraction septum magnet

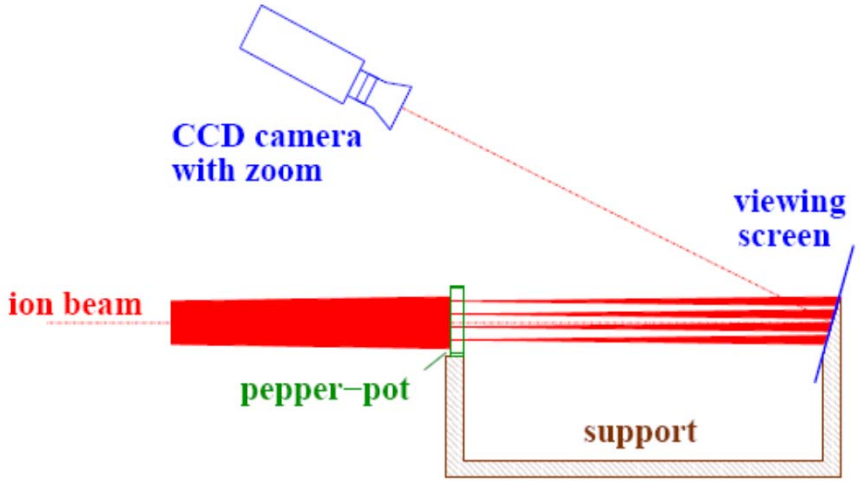
Power losses due to Eddy currents
Stray field analysis→
Influence on the circulating beam
Choice of vacuum chamber
→ Septum acceptance

Oleksii Gorda
Collector Ring (GSI),
Institut für Angewandte Physik (Frankfurt Universität)

Scitillation screens



- Scintillator screens
  → day zero diagnostics in beam transport lines (medium energies)
- Problems: Dynamic range, aging, material dependence of the measurements
- We are interested in the beam-flux dependence of the light

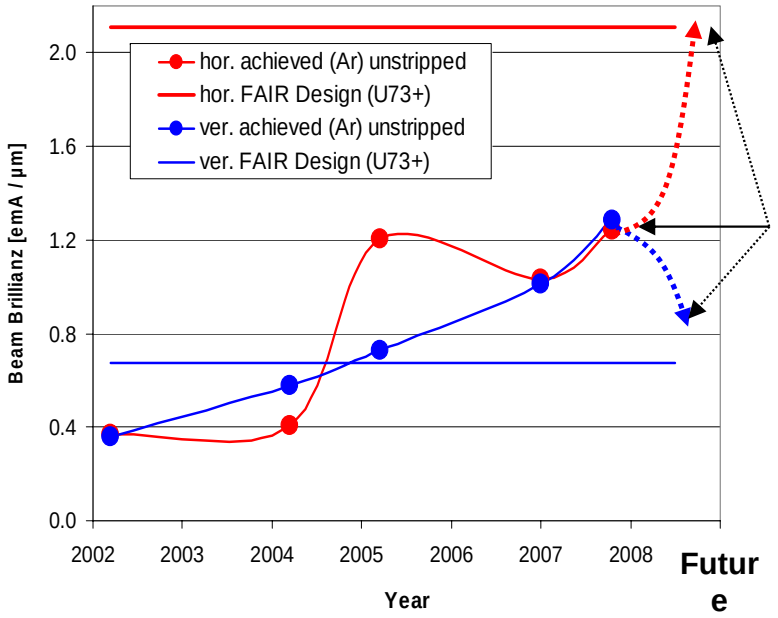


Flux- and time-dependence of the scintillation mechanism in Al_2O_3.

Application → pepper pot emittance meter

Eiko Gütlich
Strahldiagnose (GSI)
Institut für Angewandte Physik (Frankfurt Universität)

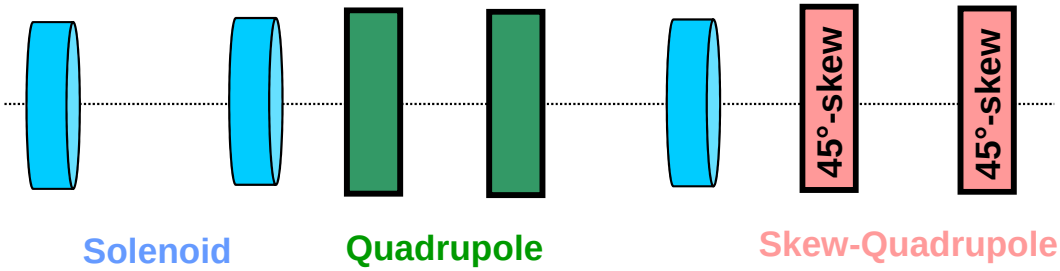
Beam transport and emittance manipulation

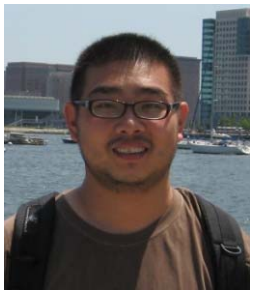


$E_x * E_y$ = const

- Transverse emittance splitting
  → non symplectic transformation
  (Beam stripper in solenoid field)
- Transverse phase space coupling
  → decoupling at low energies
  (Emittance splitter, solenoids and skew quads)

→ higher brilliance for synchrotron injection





Chen Xiao
LINAC (GSI)
Institut für Angewandte Physik (Frankfurt Universität)