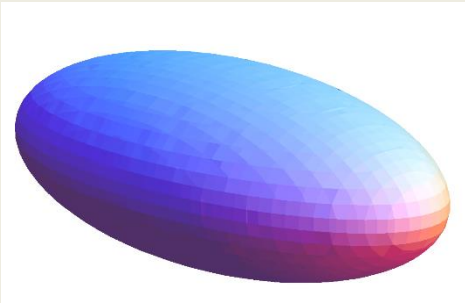
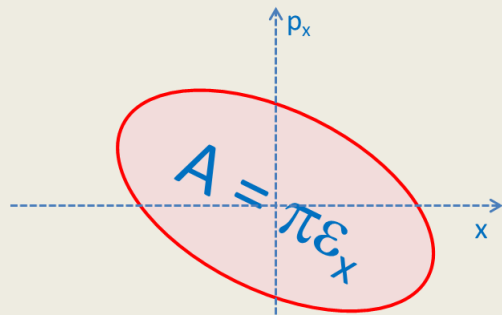


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The transverse phase space volume of a particle beam



can be determined by measuring its emittances ϵ_x ϵ_y , i.e. its projections in x - p_x and y - p_y planes,

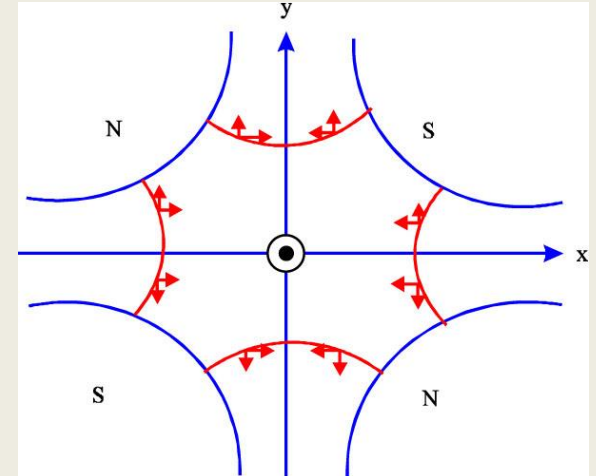
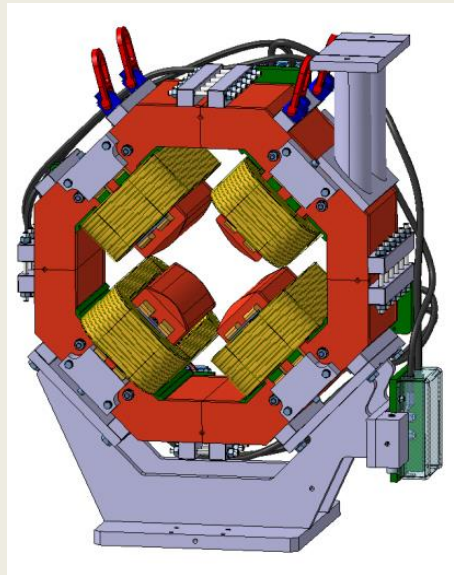


and the corresponding correlations.

Dr. M. Dehn, Prof. F. Hug, Prof. A. Meseck,
MAMI and MESA Team

Quarupole Scan technique

Using the quadrupole-scan technique, the emittances can be measured. For this, quadrupole



strengths are varied and corresponding beam sizes are measured on a screen.

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1) Measure the magnetic fields of the quadrupole magnets

2) Simulate the quadrupole scan taking into account the magnetic measurements

3) Carry out quadrupole scans at MAMI facility

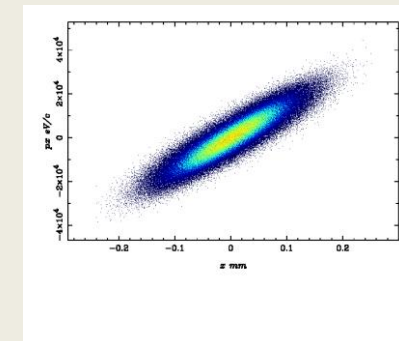
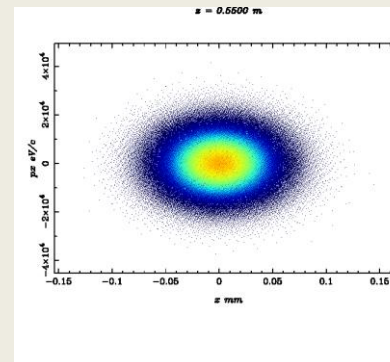
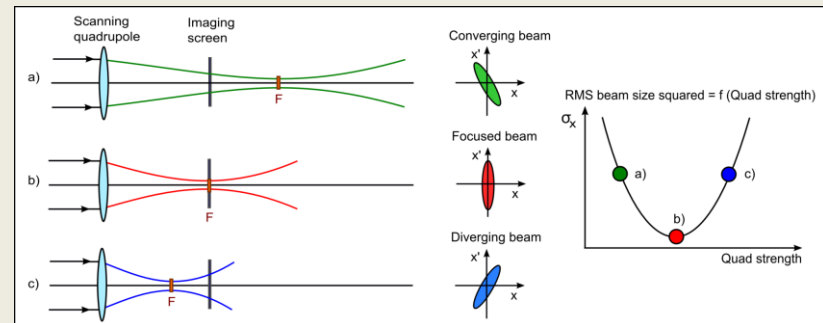
* The order of step 2 and 3 can be reversed.

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Learn about

- Magnets
- Magnetic field measurements
- Beam dynamics
- Particle simulation
- Beam profile measurements
- MAMI operation
- Data analysis

## Quarupole Scan Calculation and Simulation



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