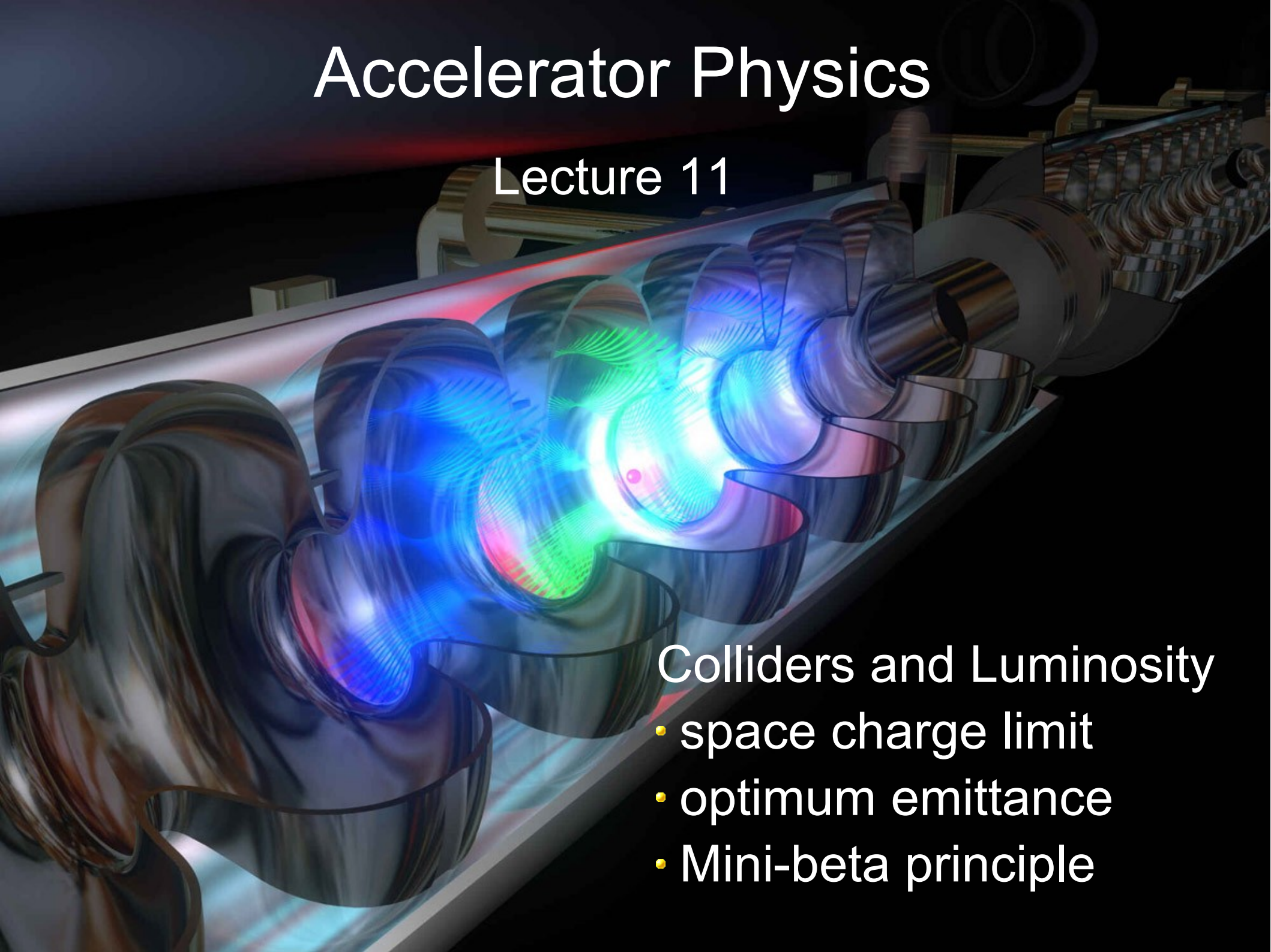


Accelerator Physics

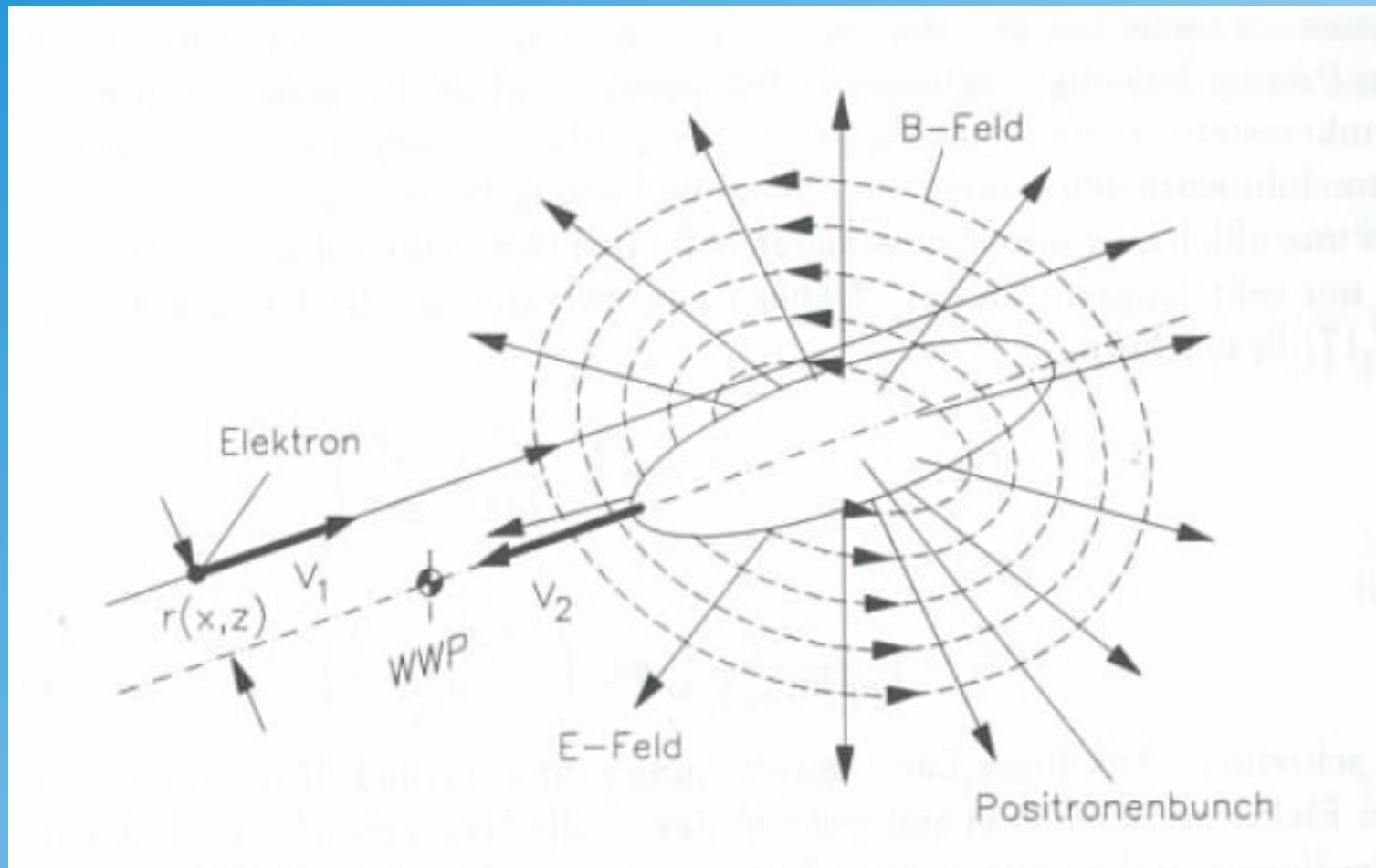
Lecture 11



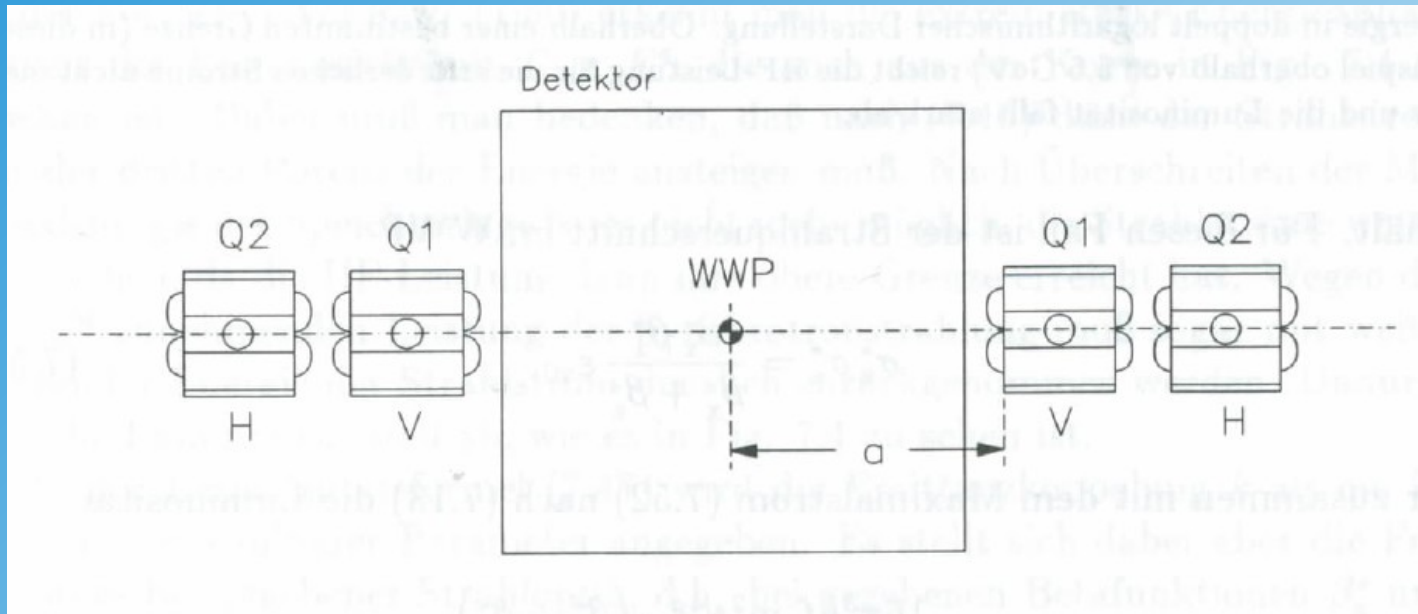
Colliders and Luminosity

- space charge limit
- optimum emittance
- Mini-beta principle

Beam-Beam Interactions



Final Focus



Chromaticity from Quads

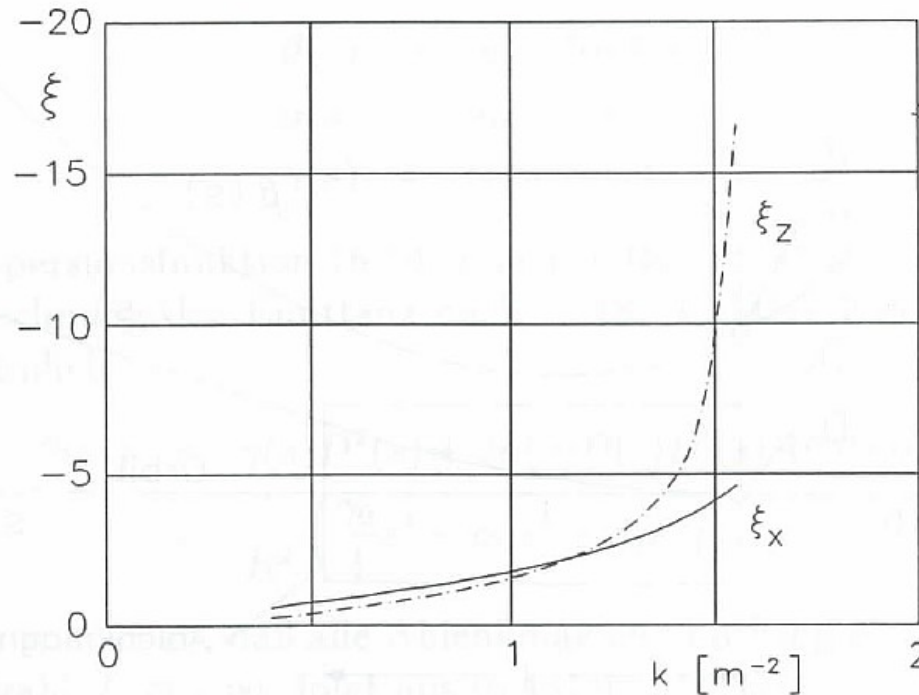
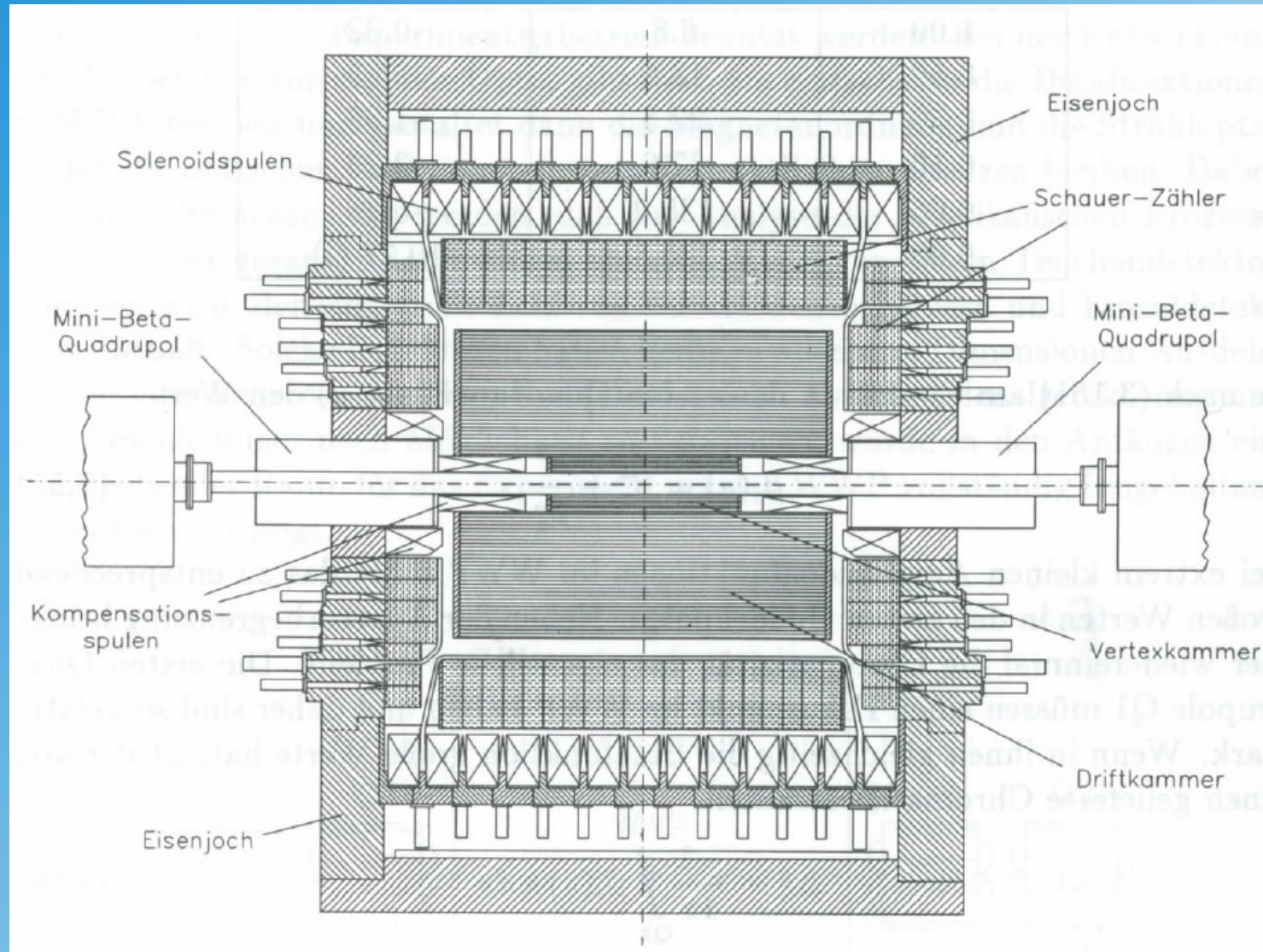
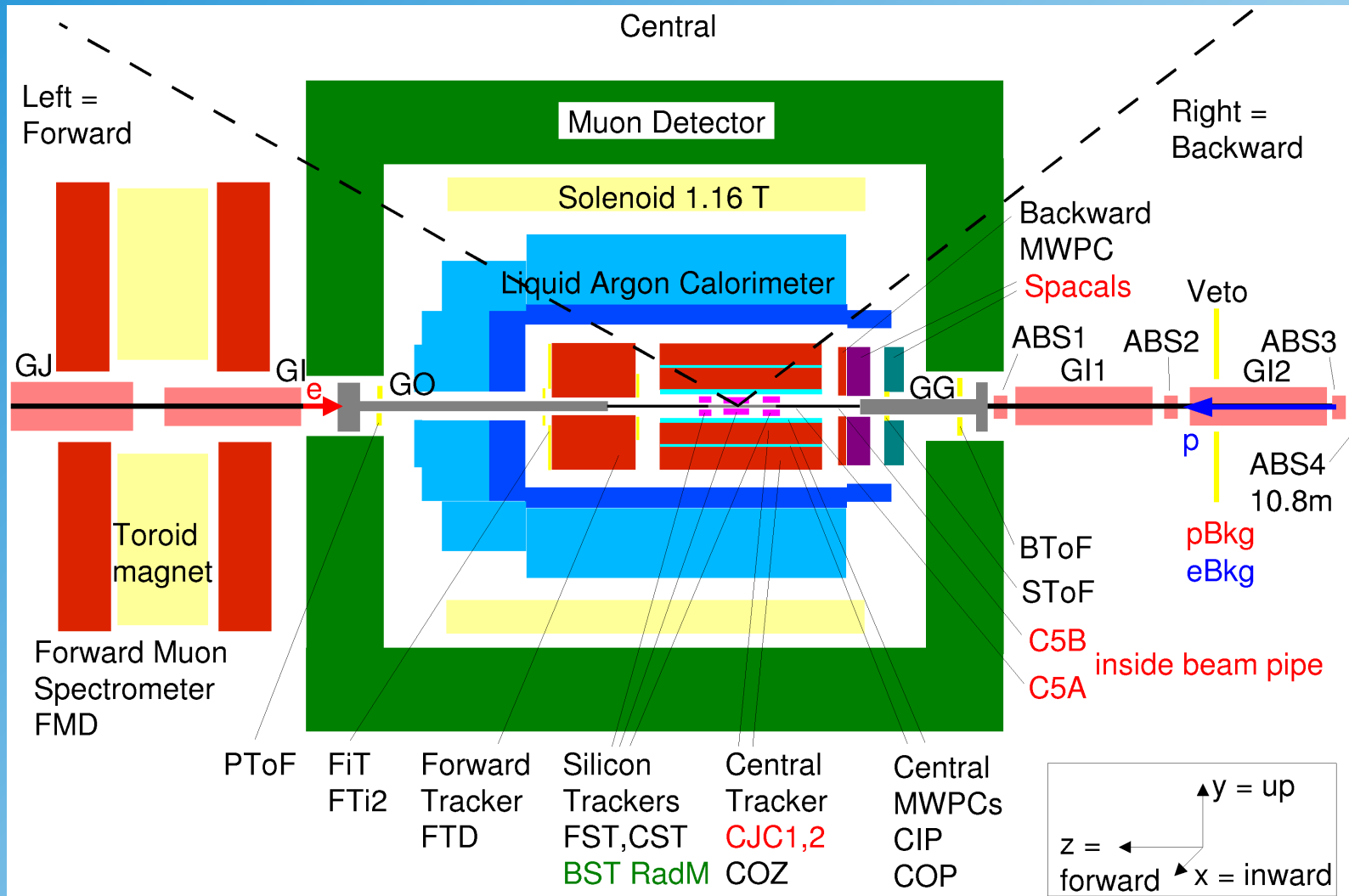


Fig. 6.6 Verlauf der horizontalen Chromatizitäten $\xi_{x,z}$ des FODO-Modellrings als Funktion der Quadrupolstärke k .

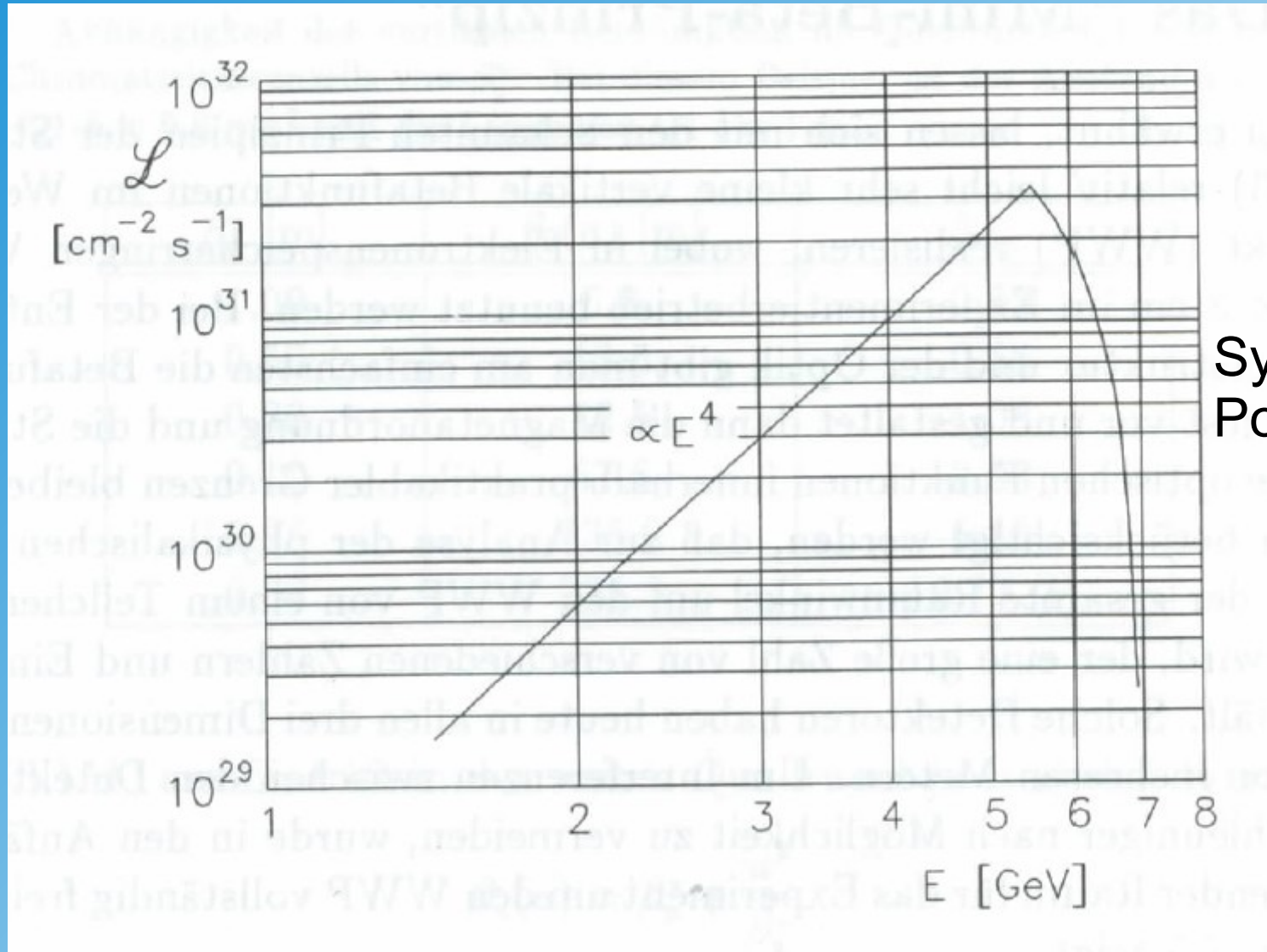
ARGUS Detector (DORIS, DESY)



GO/GG Magnet at HERA (H1)

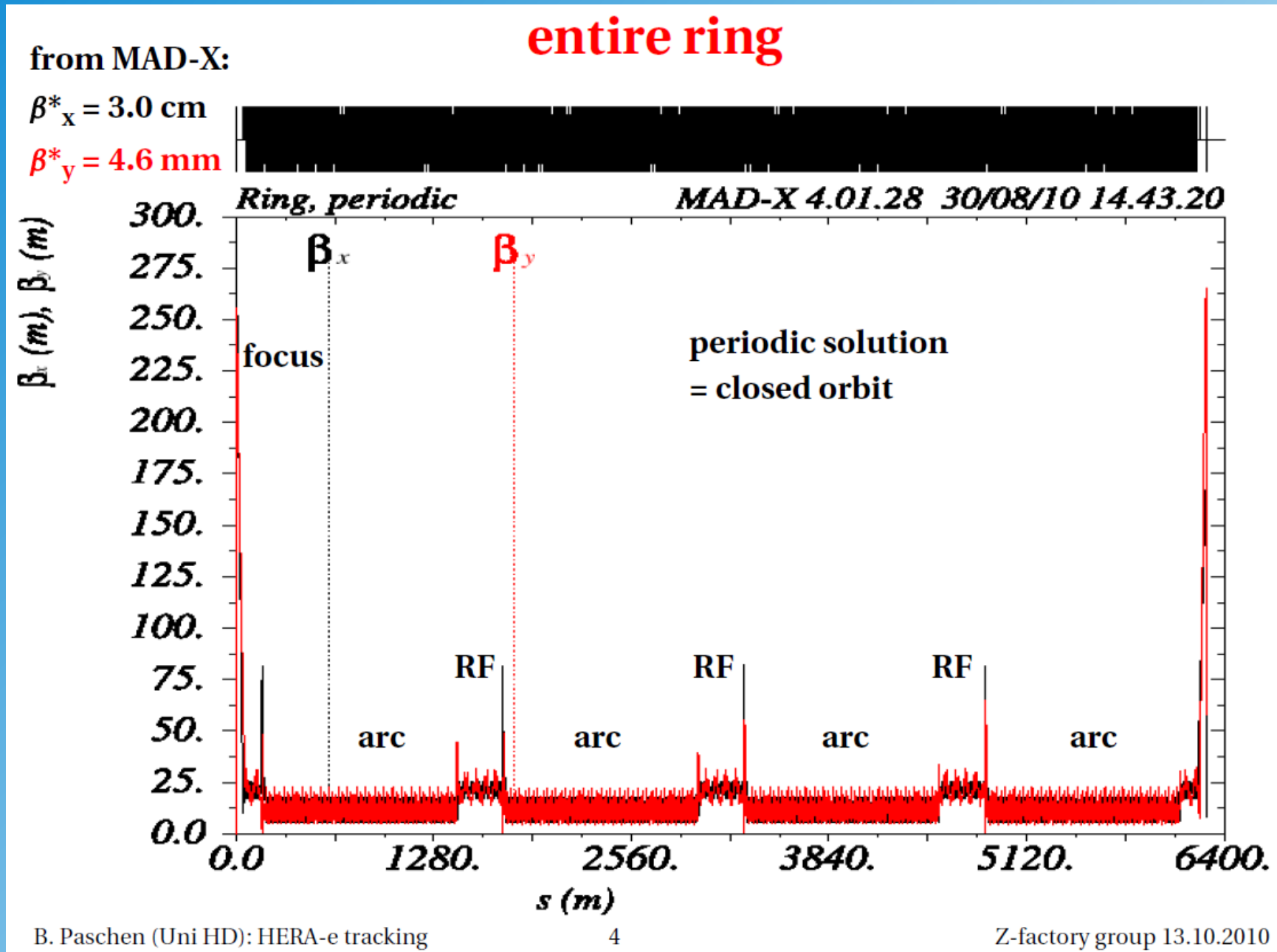


Luminosity for Space Charge Limit

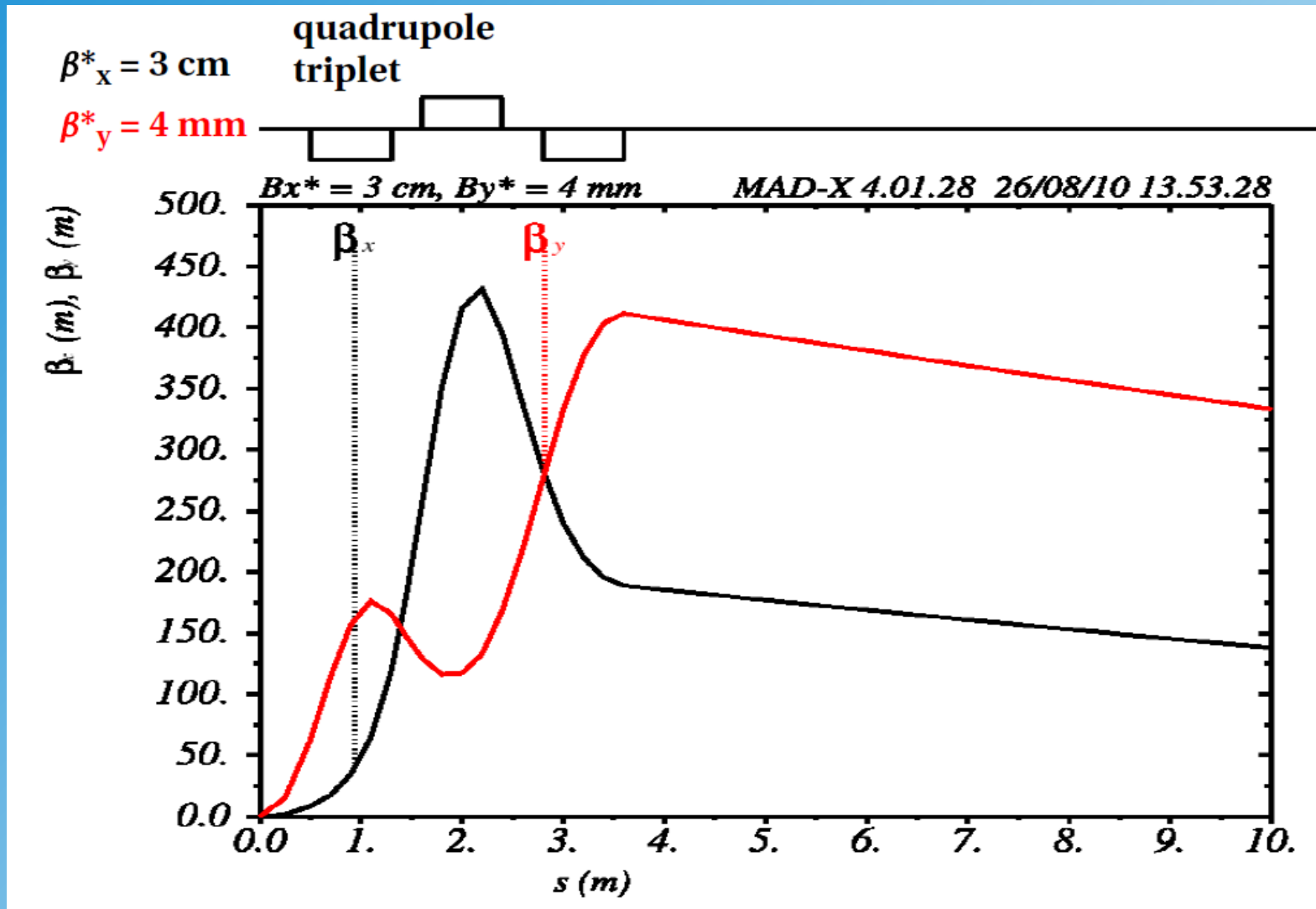


Synchr.
Power Limit

Positron Ring in HERA

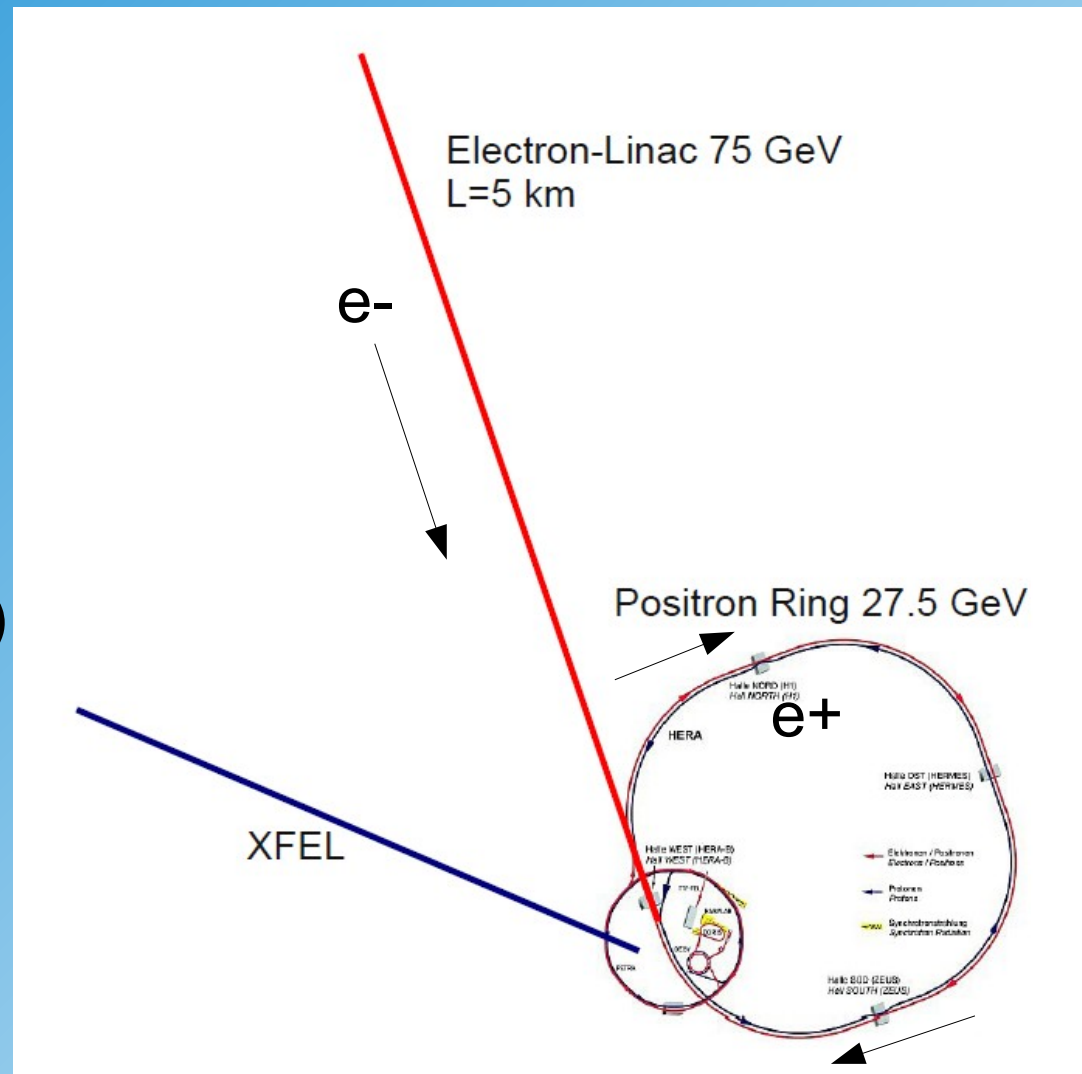


Final Focus Matching



Ring-Linac Z-Factory Proposal

- electron current limited by acceleration power
- positron current limited by synchr. radiation damping (emittance + energy loss)



small emittance is crucial!

Emittance in FODO Ring

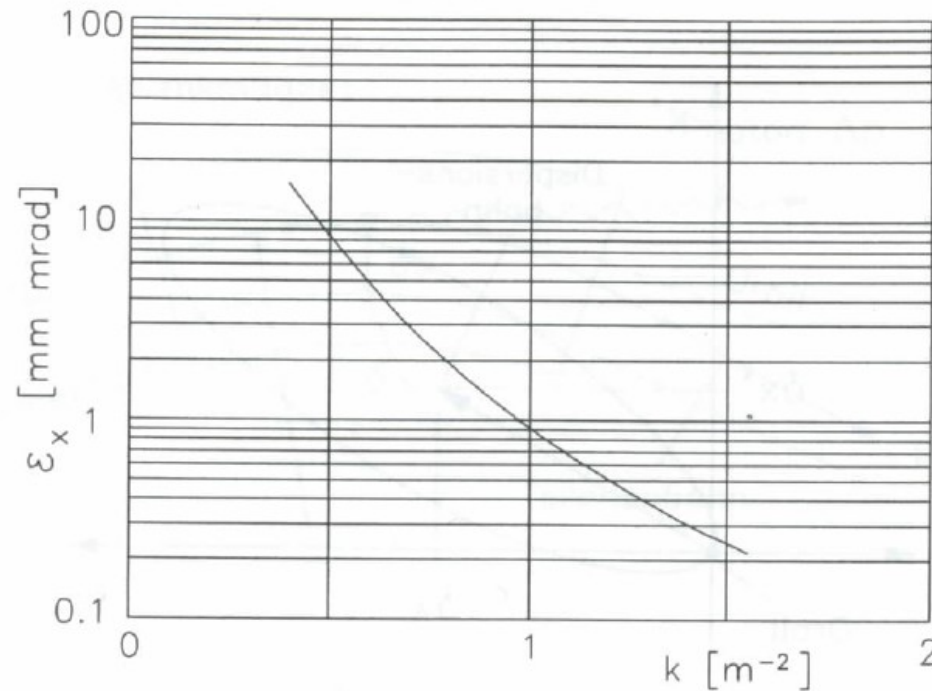
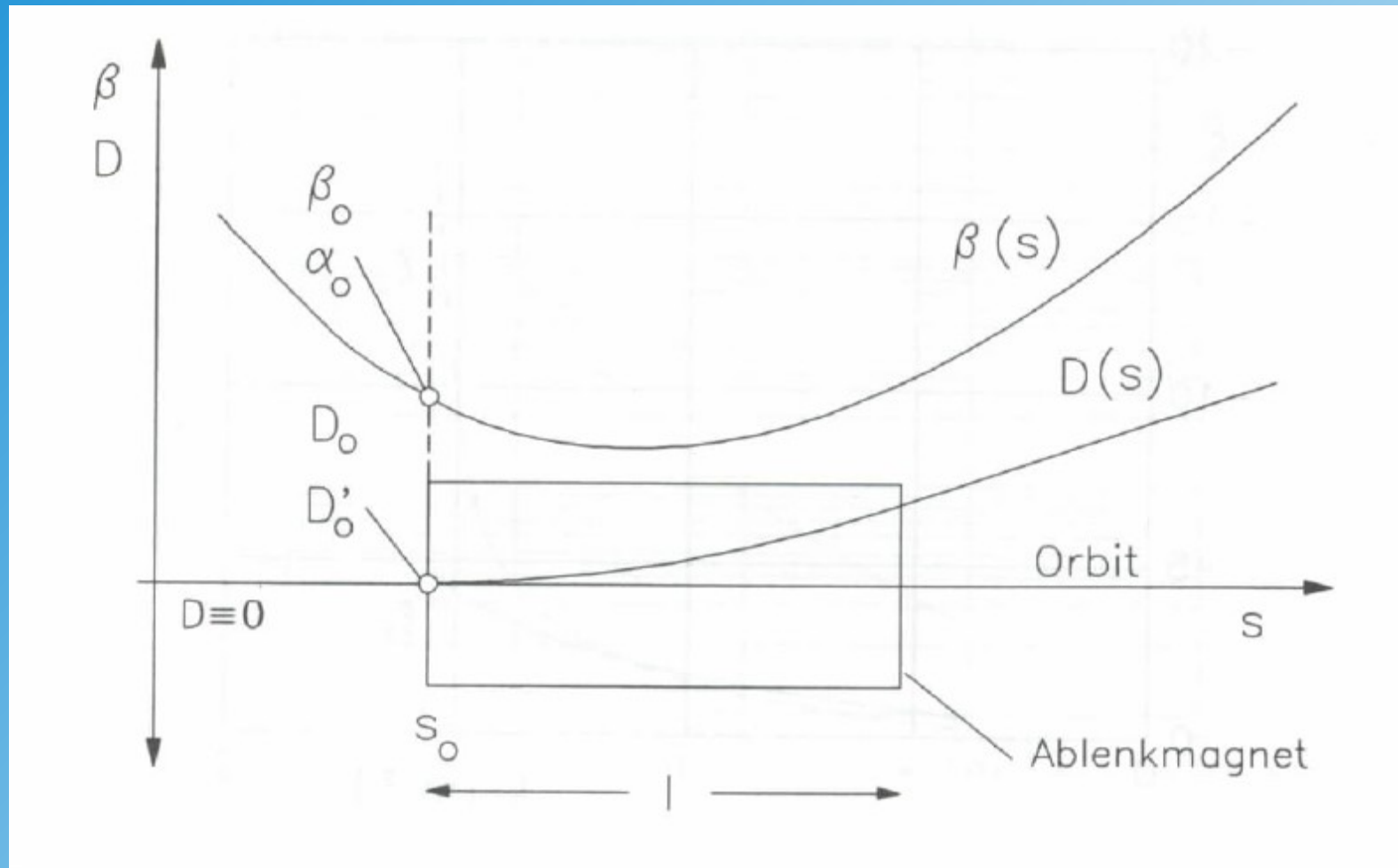


Fig. 6.5 Verlauf der horizontalen Emittanz des FODO-Modellrings als Funktion der Quadrupolstärke k .

Optimum Beta Function in Dipole



Ring-Linac Z-factory Design Study

