

Virtual Pepper-Pot Technique for 4D Phase Space Studies

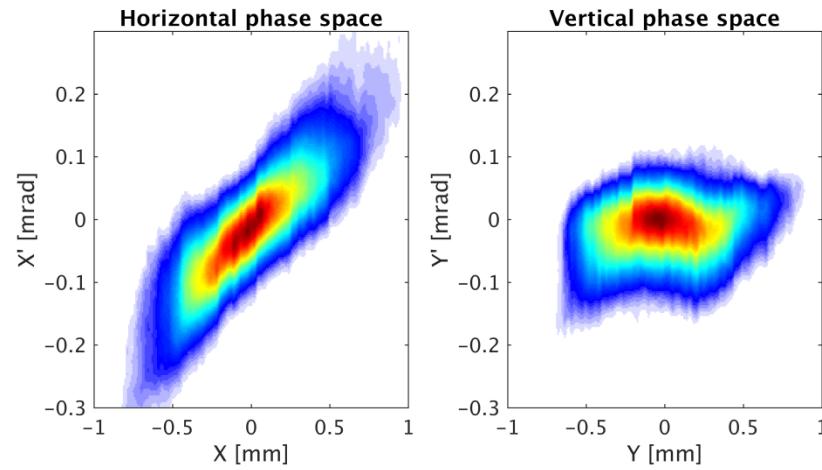
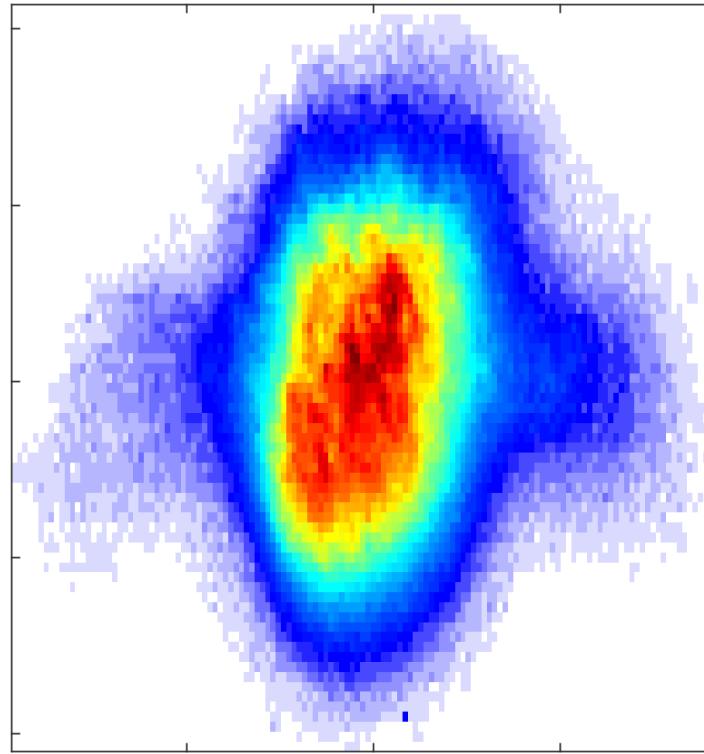
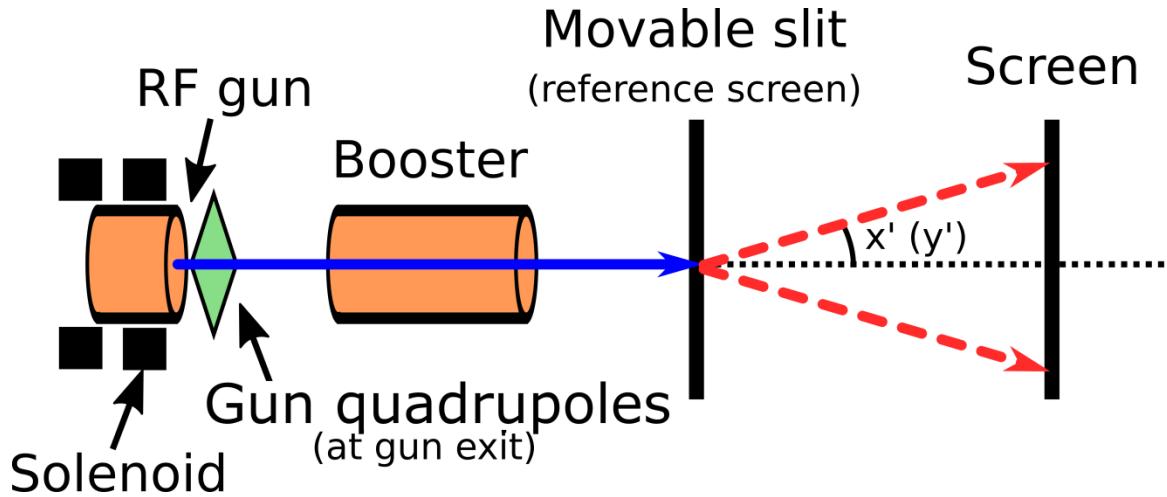
G. Z. Georgiev, M. Krasilnikov, DESY, Zeuthen

$$\sigma^{4D} = \begin{pmatrix} \langle xx \rangle & \langle x'x \rangle & \langle yx \rangle & \langle y'x \rangle \\ \langle xx' \rangle & \langle x'x' \rangle & \langle yx' \rangle & \langle y'x' \rangle \\ \langle xy \rangle & \langle x'y \rangle & \langle yy \rangle & \langle y'y \rangle \\ \langle xy' \rangle & \langle x'y' \rangle & \langle yy' \rangle & \langle y'y' \rangle \end{pmatrix}$$

Introduction

Single slit scan and beam asymmetries at PITZ

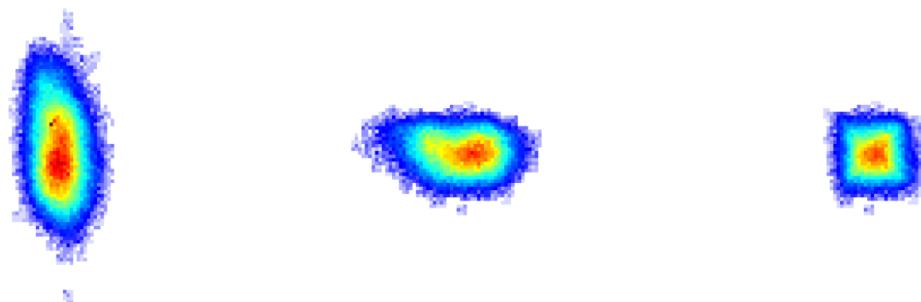
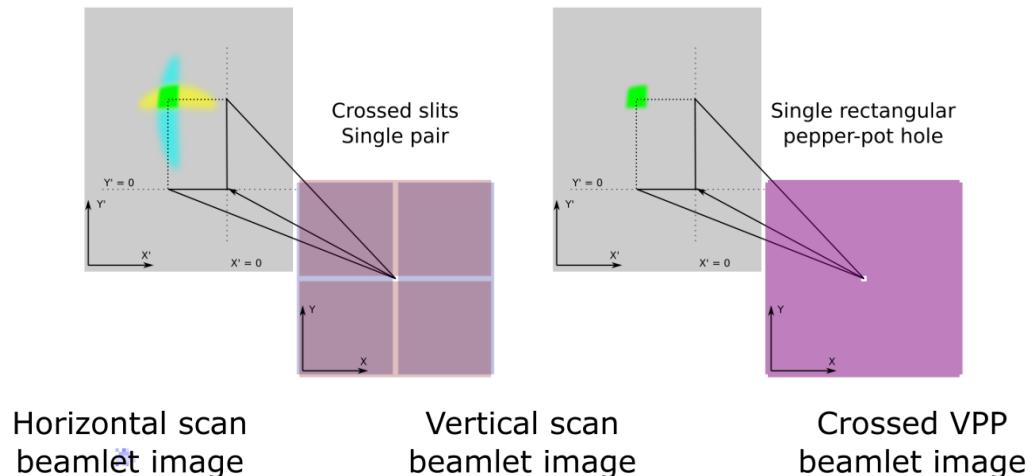
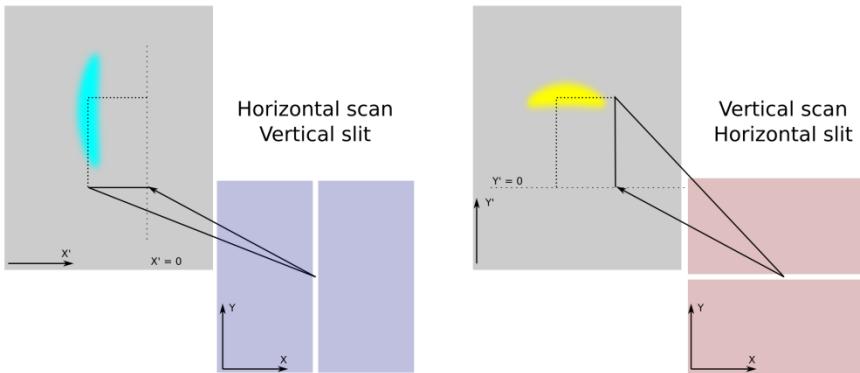
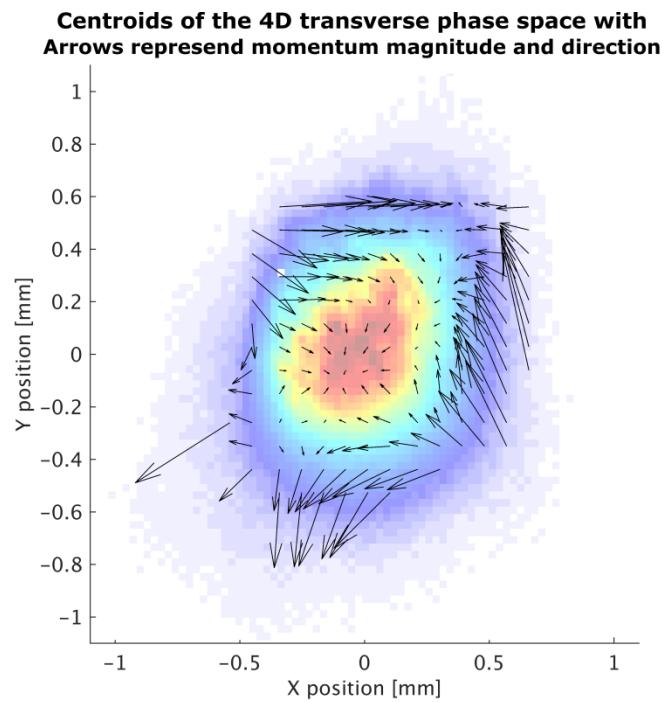
- Emittance optimization at PITZ
 - Measurement: single slit scan
- Beam asymmetries
 - Compensation with gun quadrupoles
 - Studies of 4D beam dynamics



Virtual Pepper-Pot Technique

Extention of slit scan analysis

- Postprocessing
 - Beamlet crossing
- 4D phase space centroids
- Full 4D transverse beam matrix



4D beam dynamics

Results for 0.5 nC bunch charge

- Transverse invariants
- Coupling estimation
- Comparisons

