XFEL
X-Ray Free-Electron Laser

DESY

Recent Measurements in ACC1 (12.9. & 15.9.2008)

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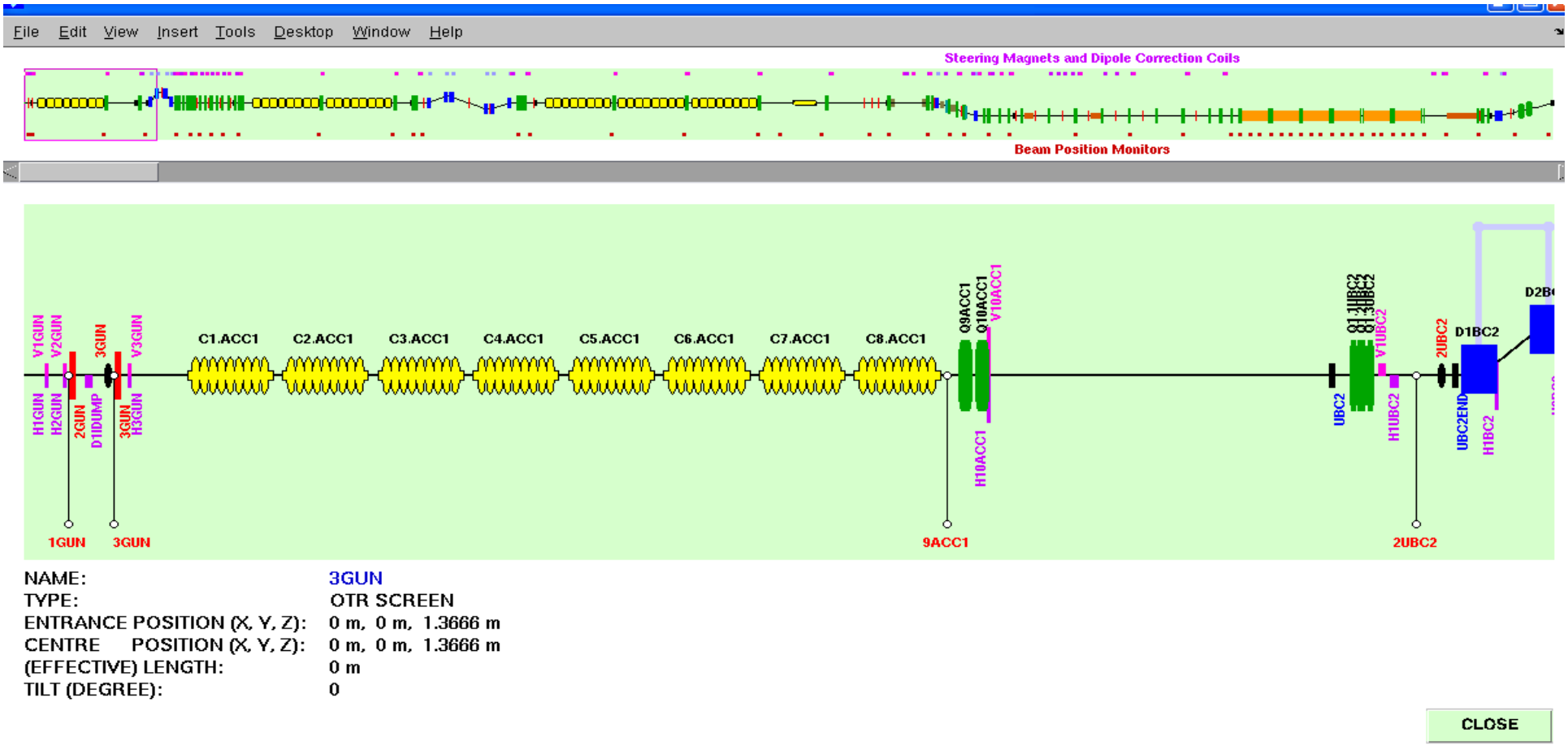
Motivation

- Preparation of ACC39 installation next year
- Wake and coupler kicks will be much stronger than in 1.3 GHz cavities
- Estimation (M. Dohlus, 19.03.2007): 3% emittance growth for 1mm offset

Goal:

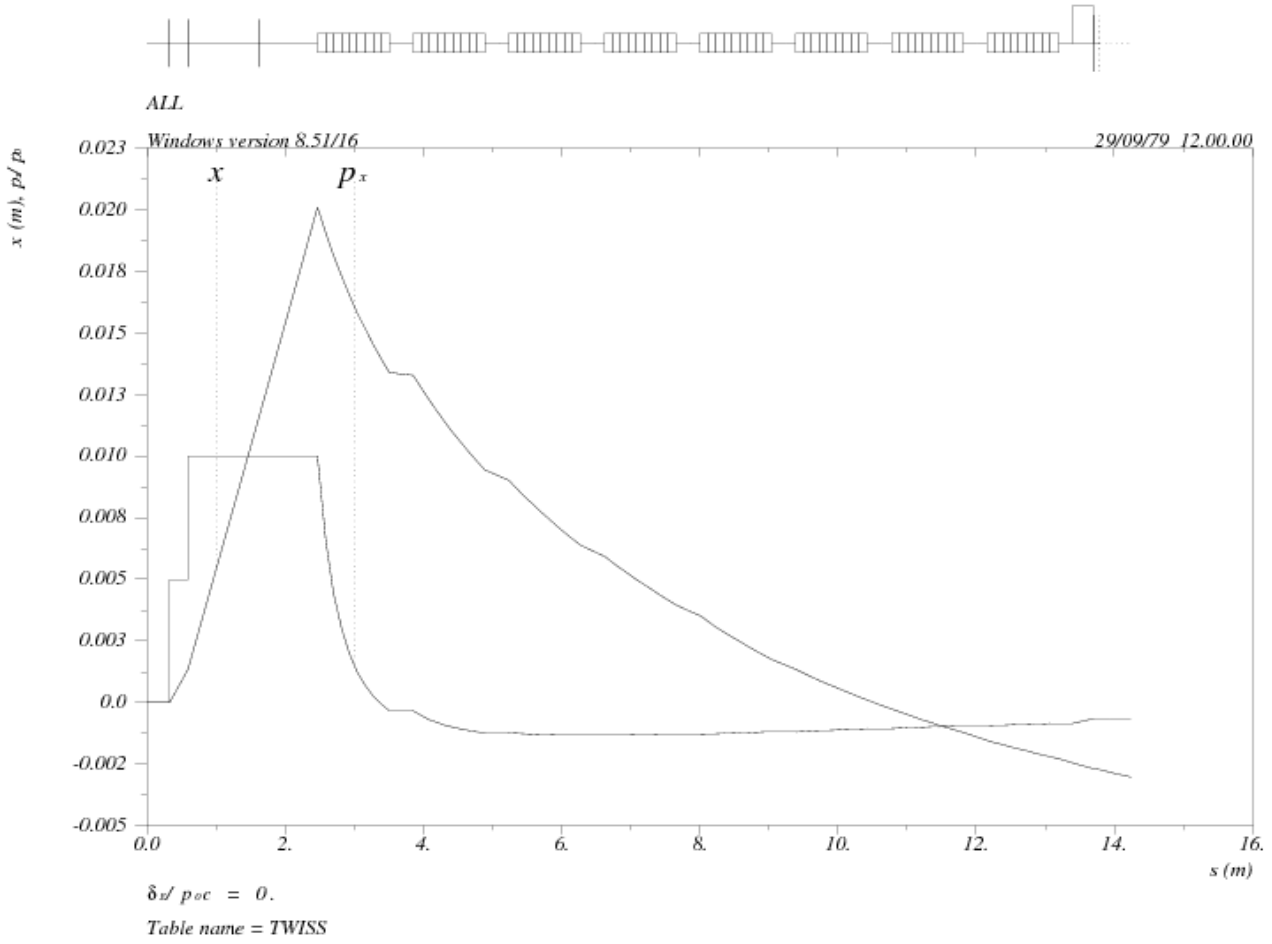
- Measure effects of wakefields and coupler kicks on the projected emittance in the present setup and compare next year (although next years FLASH will have new gun, new ACC1, …)
- Verify that enough space is available for empirical orbit tuning in the future ACC39

FLASH Setup



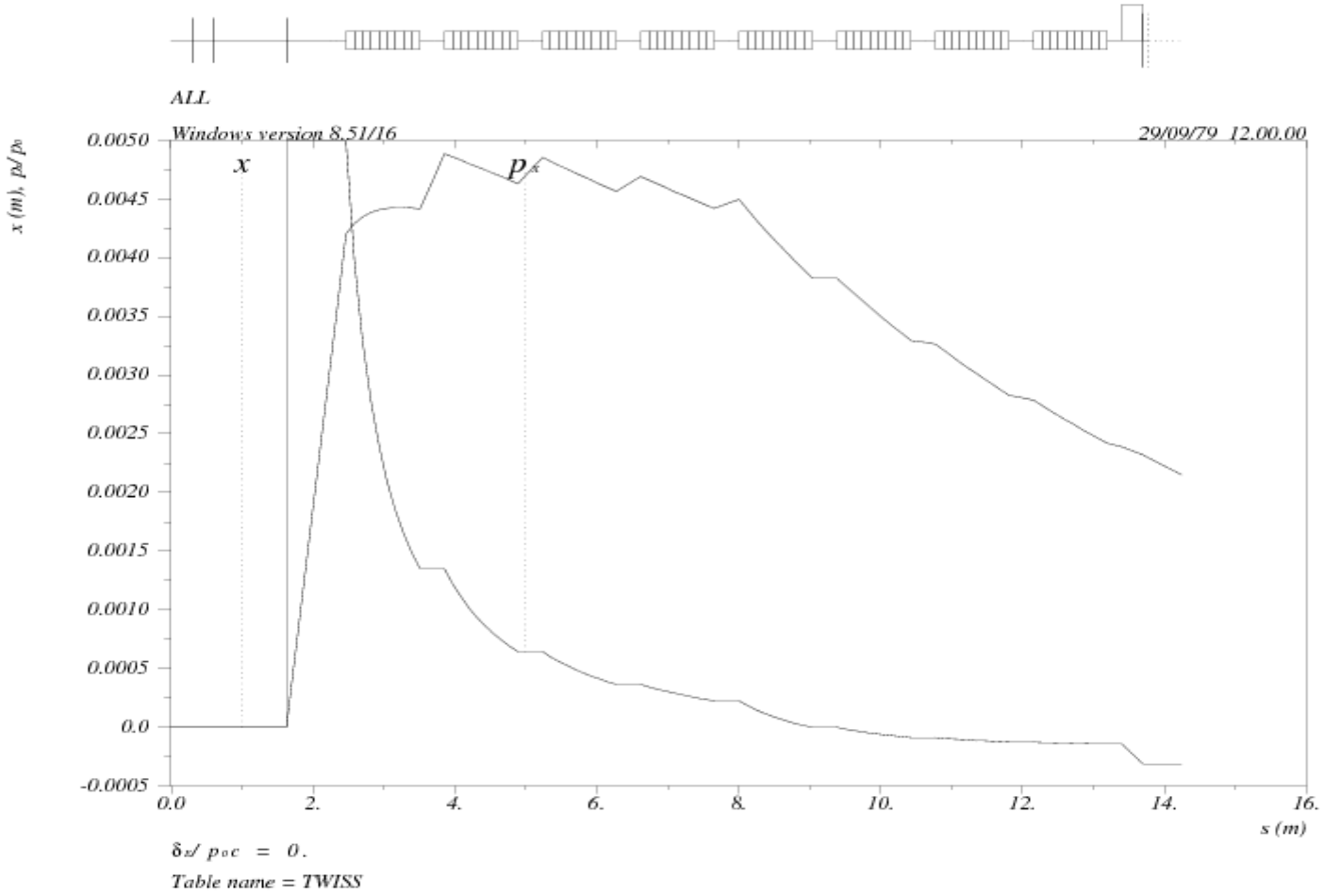
Steerers in gun are used to steer trajectory in ACC1
Eduard's Orbit Tool used to correct trajectory back to original in BC2 area (works perfect)

BUMPS in ACC1



H1Gun + H2 Gun

BUMPS in ACC1



H3 Gun

Emittance

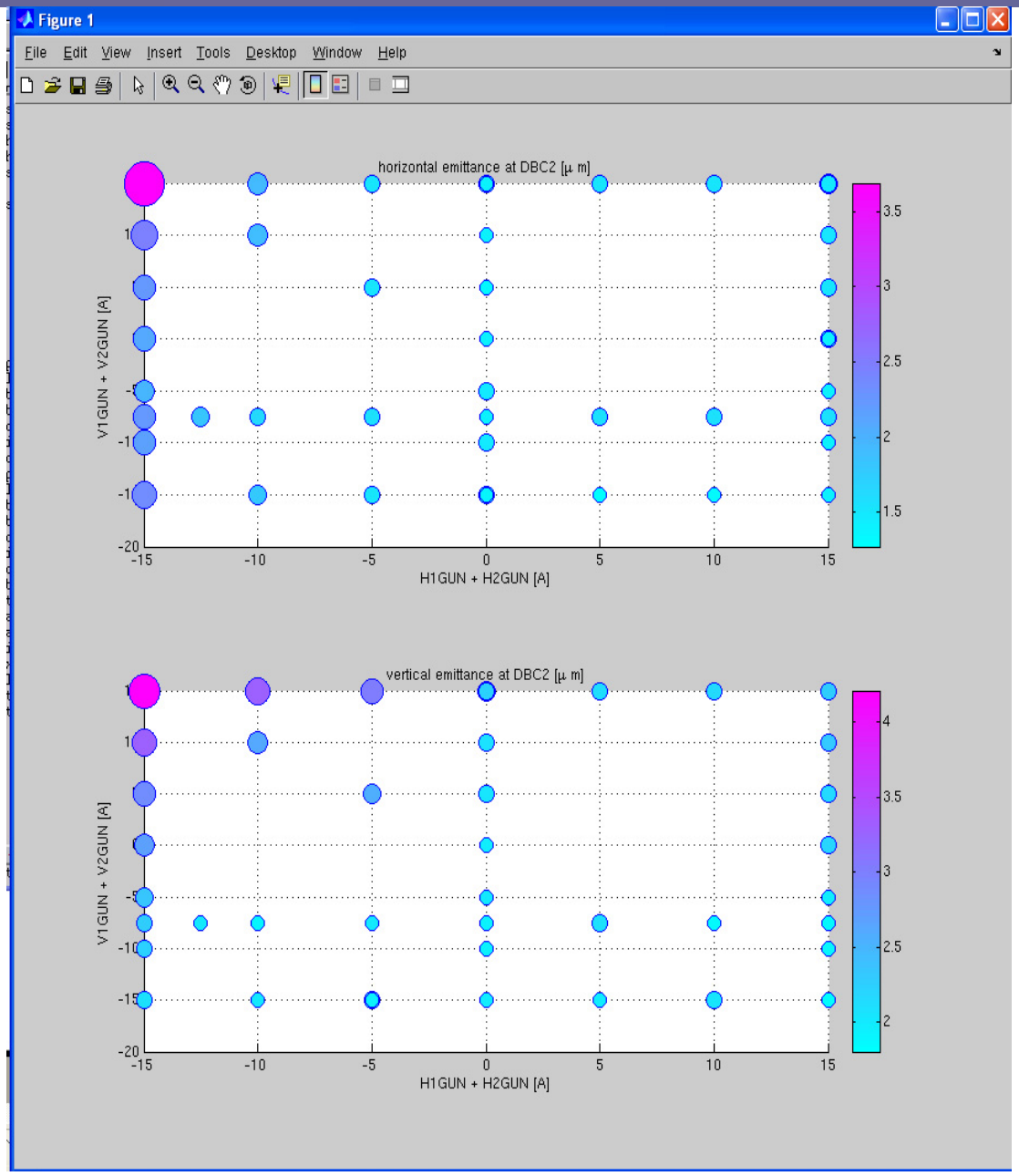
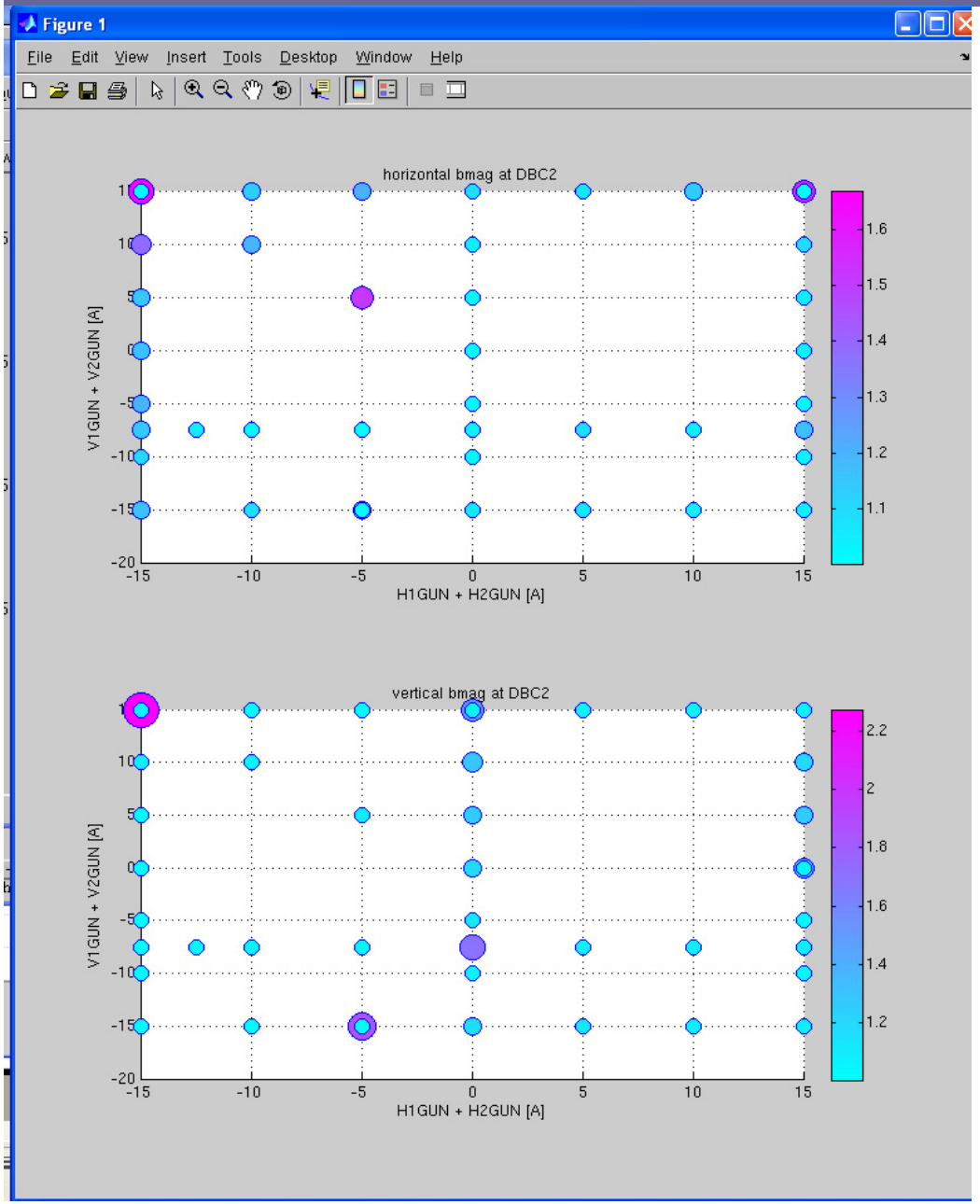
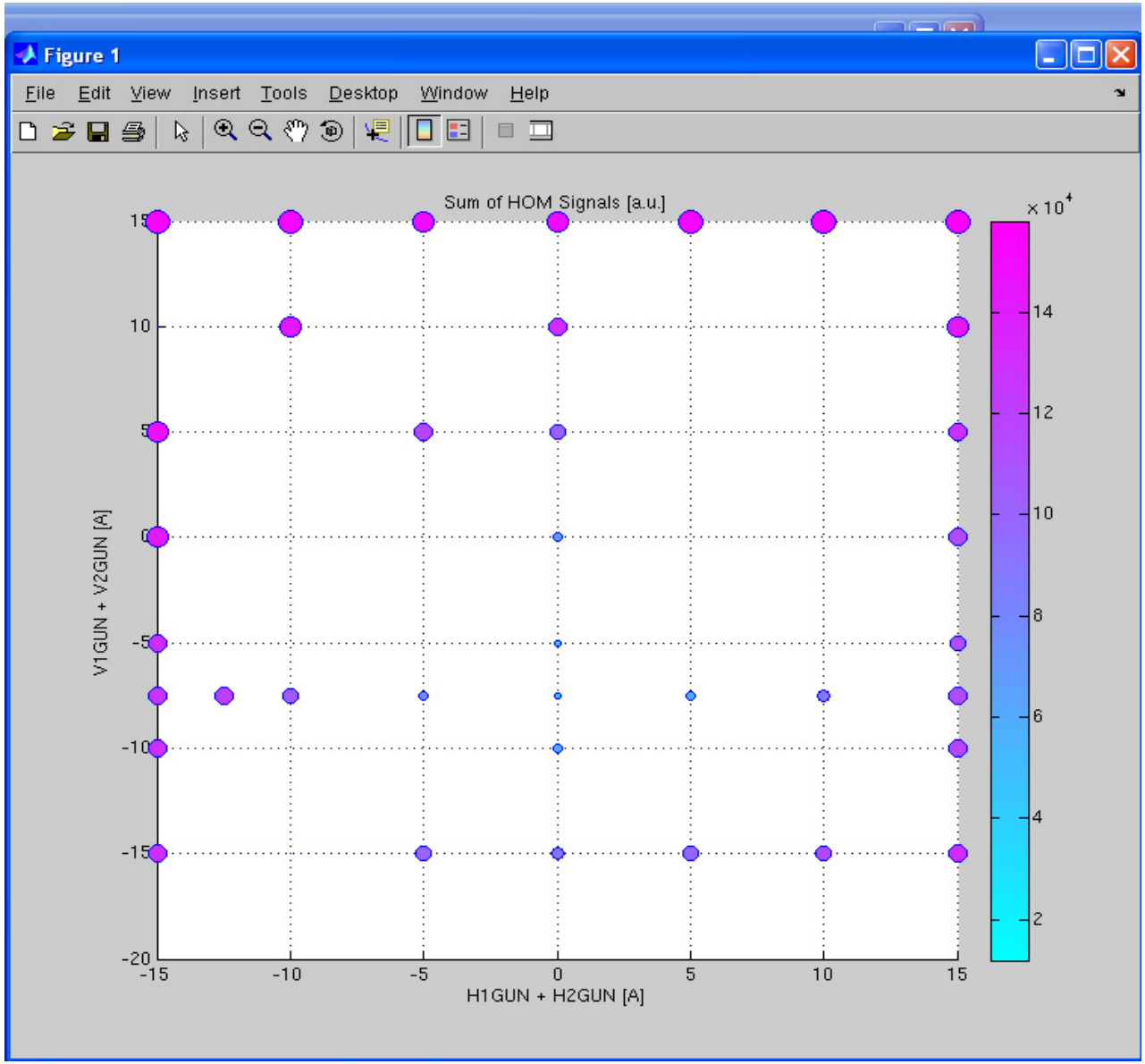


Figure 1
File Edit View Insert Tools Desktop Window Help
horizontal emittance at DBC2 [μ m]
V1GUN + V2GUN [A]
H1GUN + H2GUN [A]
vertical emittance at DBC2 [μ m]
V1GUN + V2GUN [A]
H1GUN + H2GUN [A]

Mismatch Parameter



Sum of HOM Signals



Conclusion

- Trajectory can be varied in a wide range in ACC1
- Trajectory amplitudes of up to 5 mm in C1.ACC1 show no effect on projected emittance
- Trajectory amplitudes of 20 mm in C1.ACC1 show effect on projected emittance only in the ‘upper left’ corner
- Further analysis should include optics back-tracking and coupling