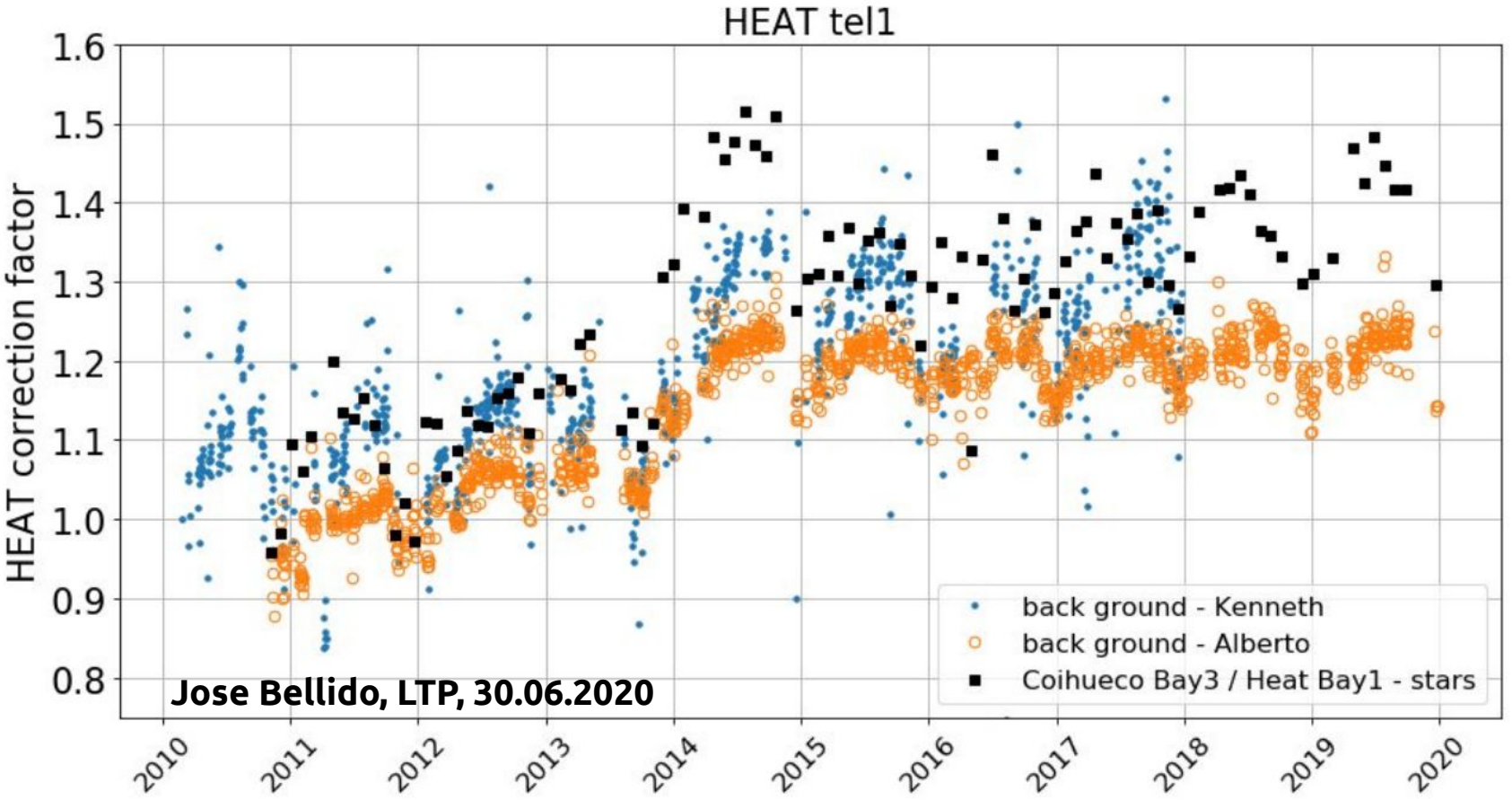
Cross Calibration with the XY-Scanner

Operations and Long Term Performance

28.07.2020

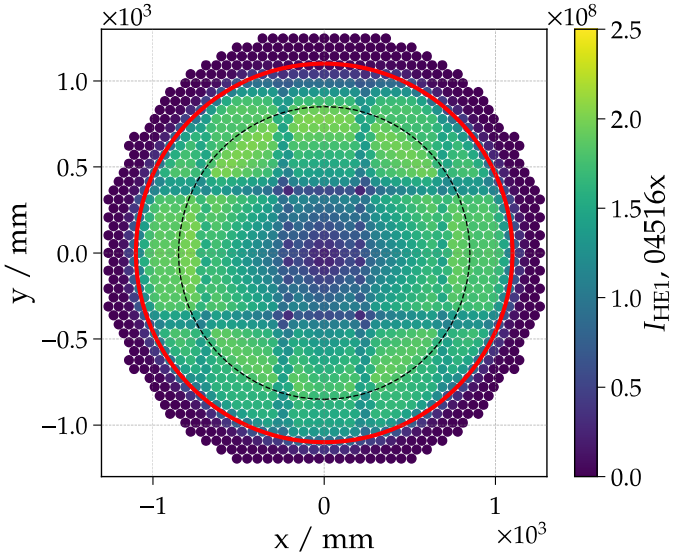
HEAT Correction Factor

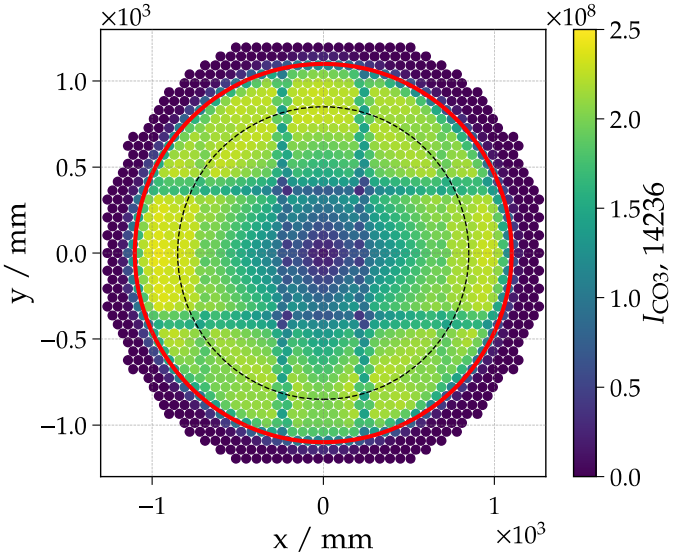


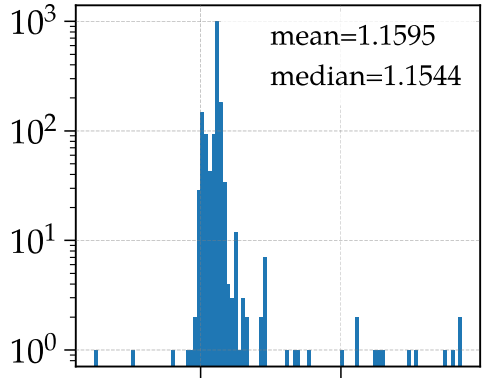
- **Presented by Jose in the last meeting**
- **Idea: cross check with the XY-Scanner measurements**

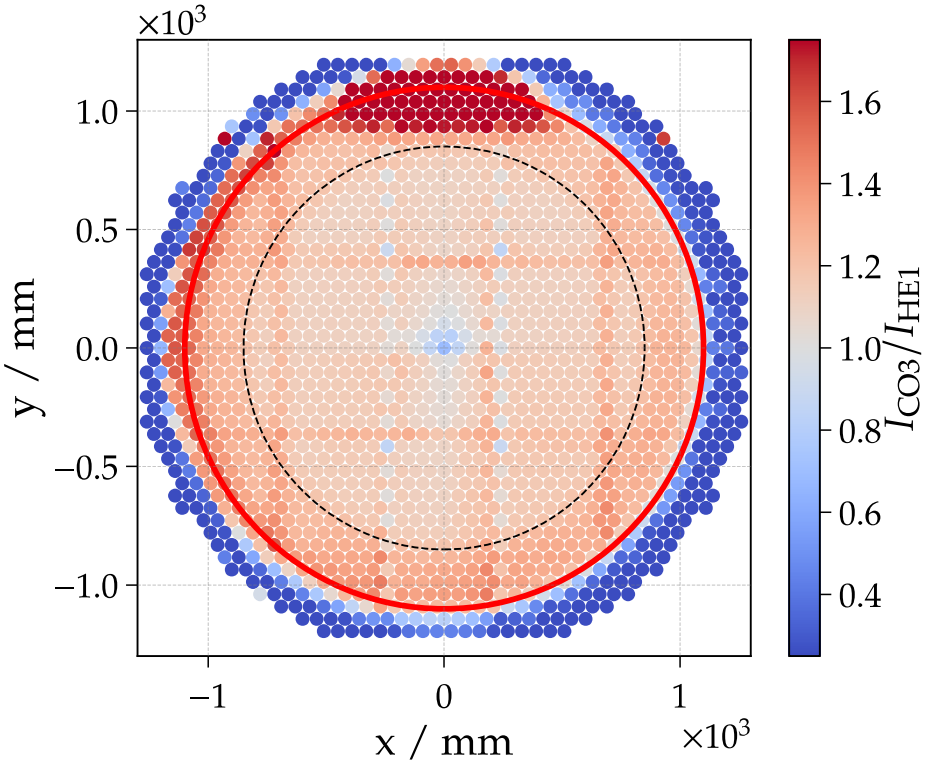
HeCo Cross Calibration: XY scanner

- First approach for He1 and Co3
- ~1600 positions of the scanner with the same light intensity at each position
- Calibration light source
- Select only common positions for He and Co telescopes
- XY scans from Nov 2019 with the Olomouc sphere
- Work in progress



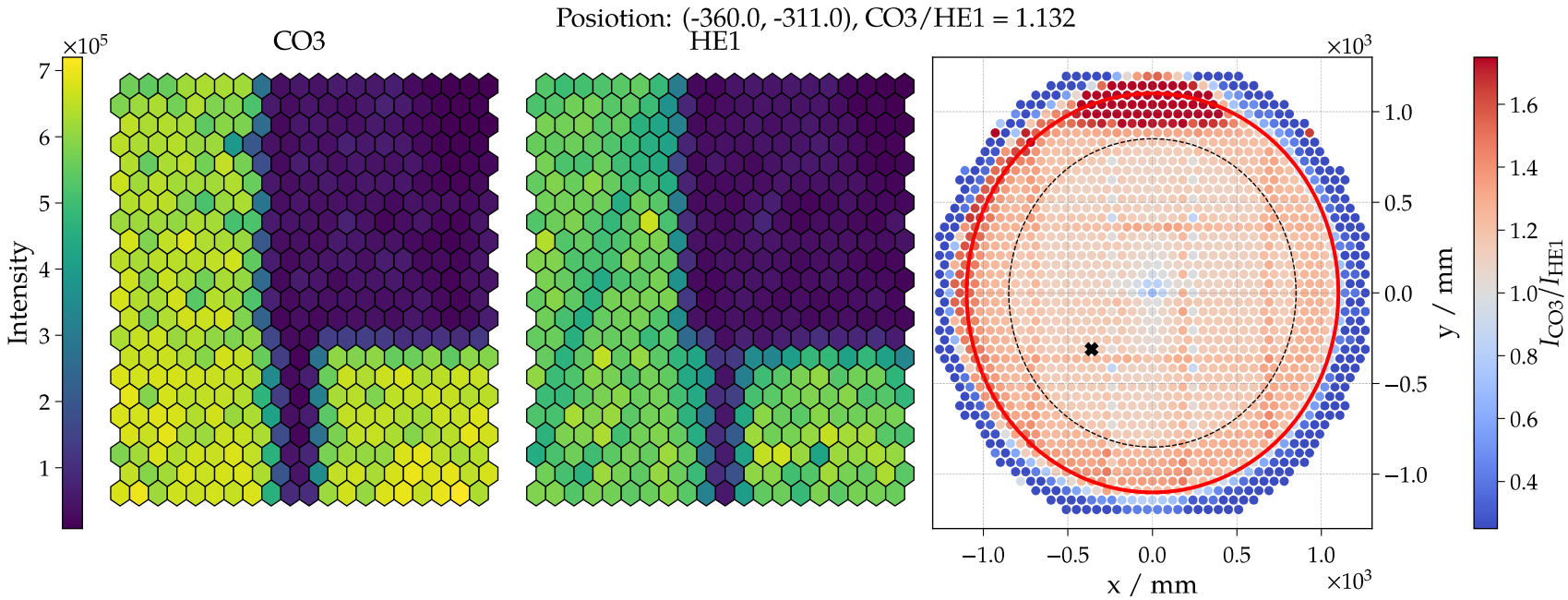


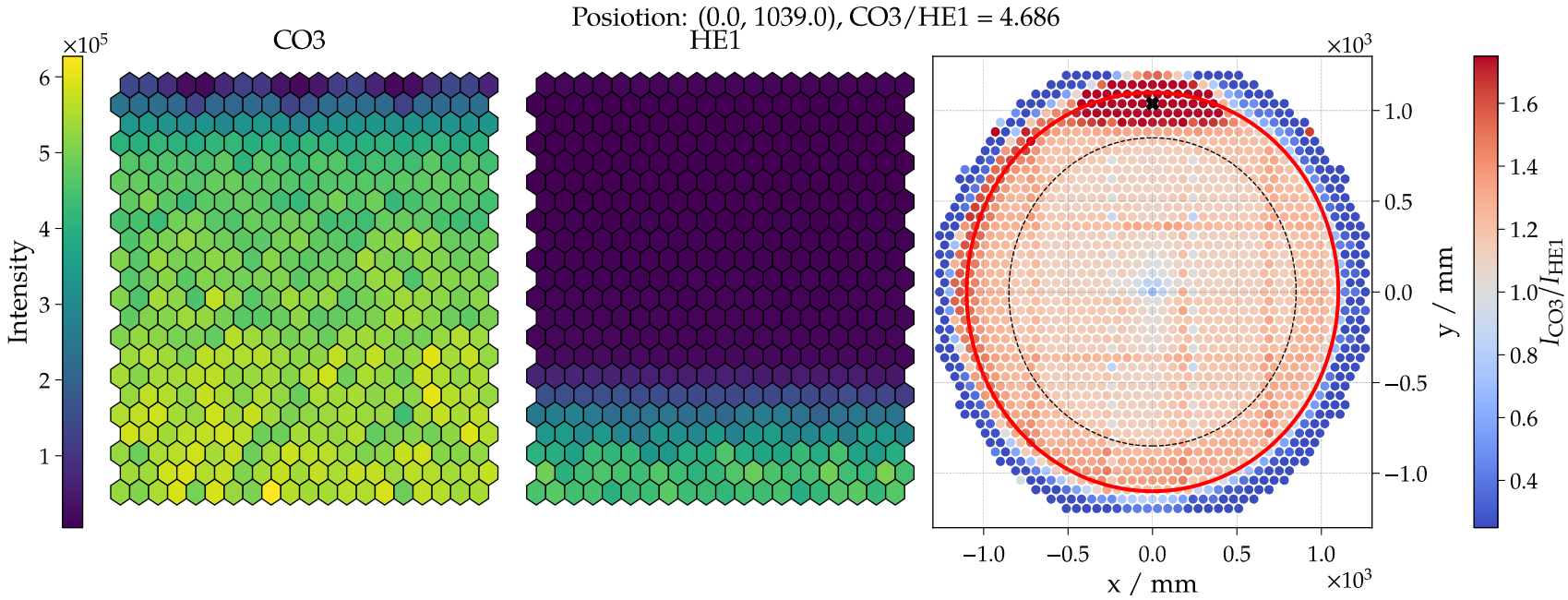




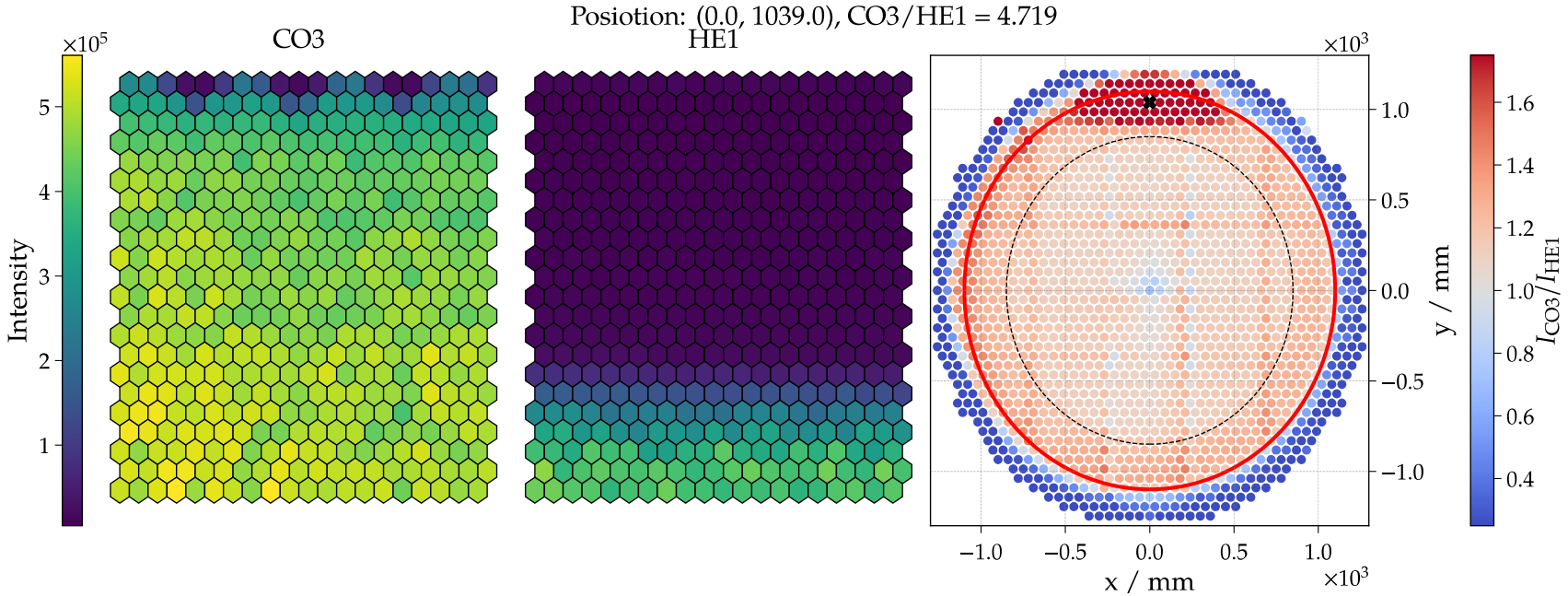
$$I = \sum_{pixel=1}^{440} \left(ADC_{pixel} \times CalA_{pixel} \right)$$

Events from CO3 and HE1



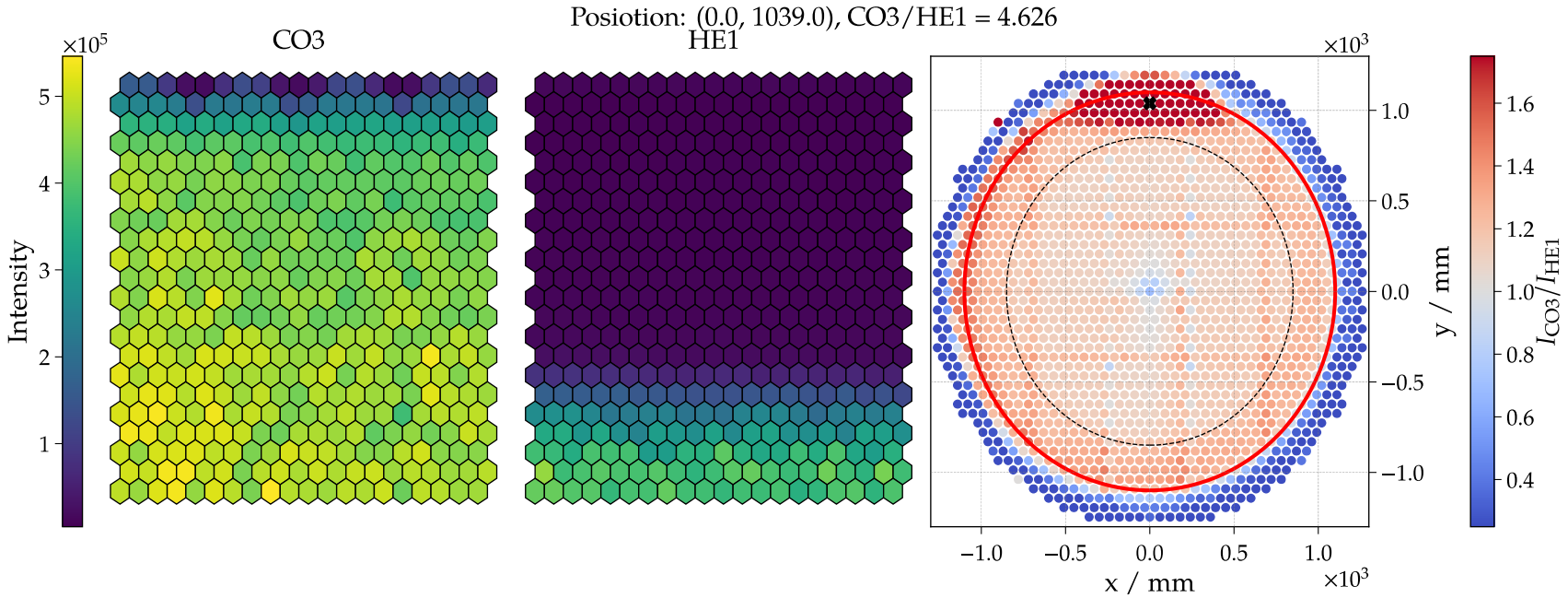


HEAT Comparison in the Past



Mar 2019

KIT sphere

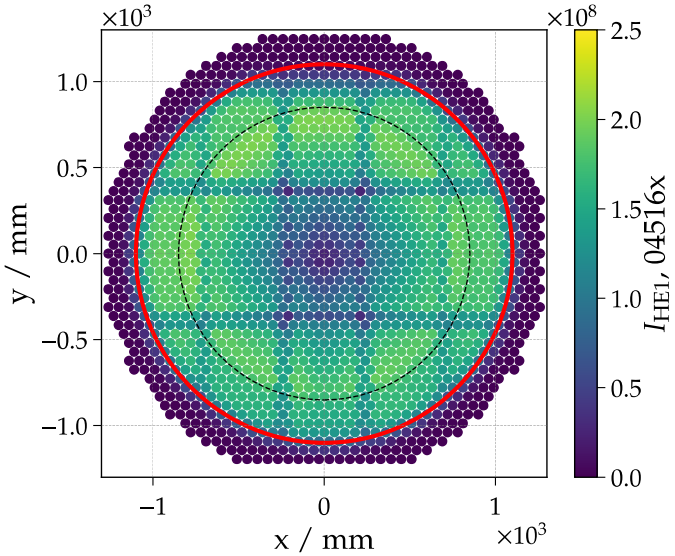


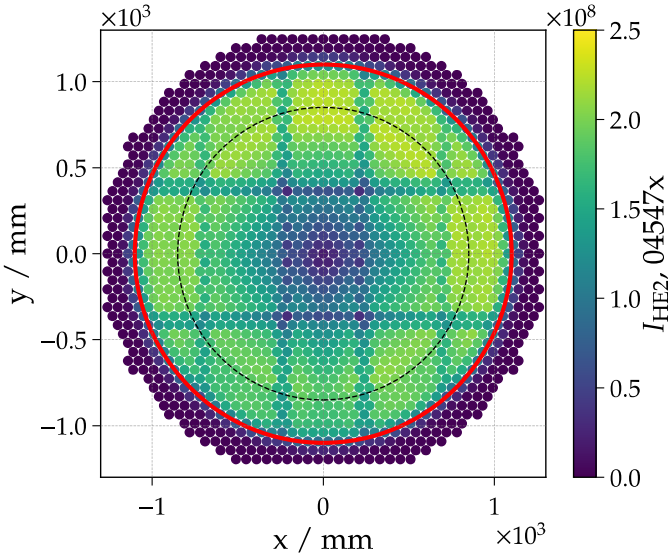
Nov 2019

KIT sphere

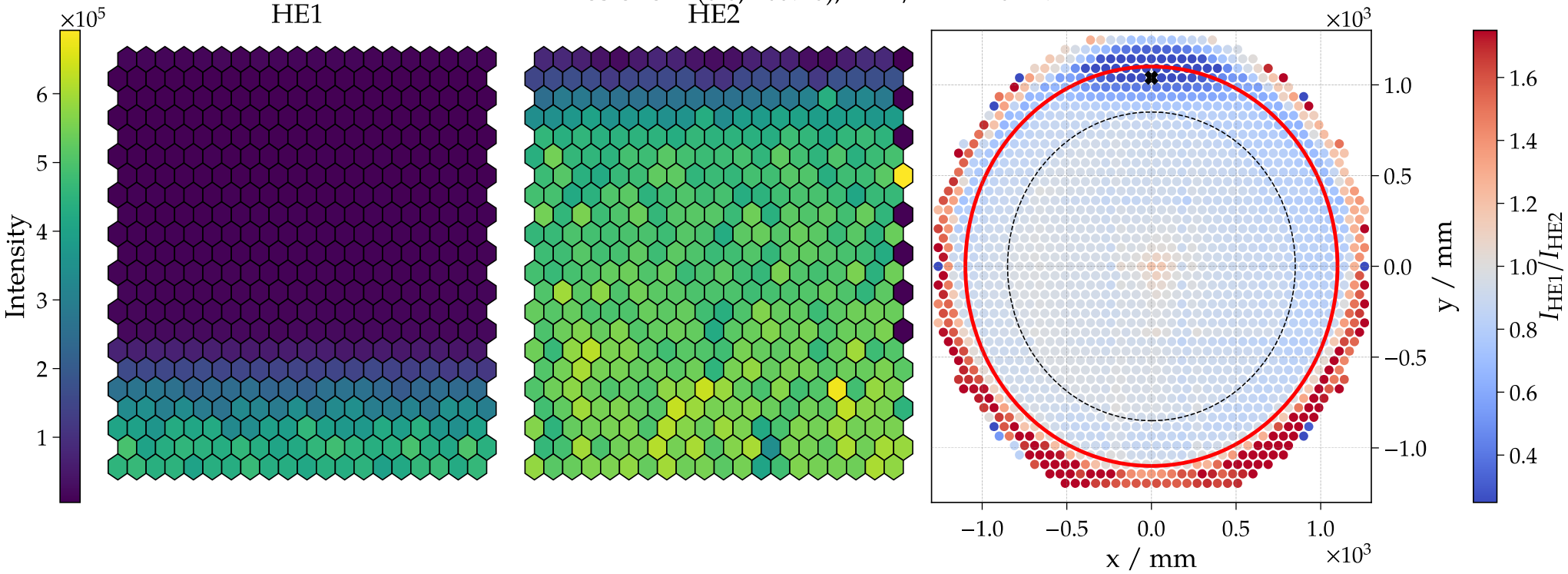
HEAT Comparison

- **Compare HEAT telescopes 1 & 2**
- **Shadow is not visible in the HEAT 2 telescope**



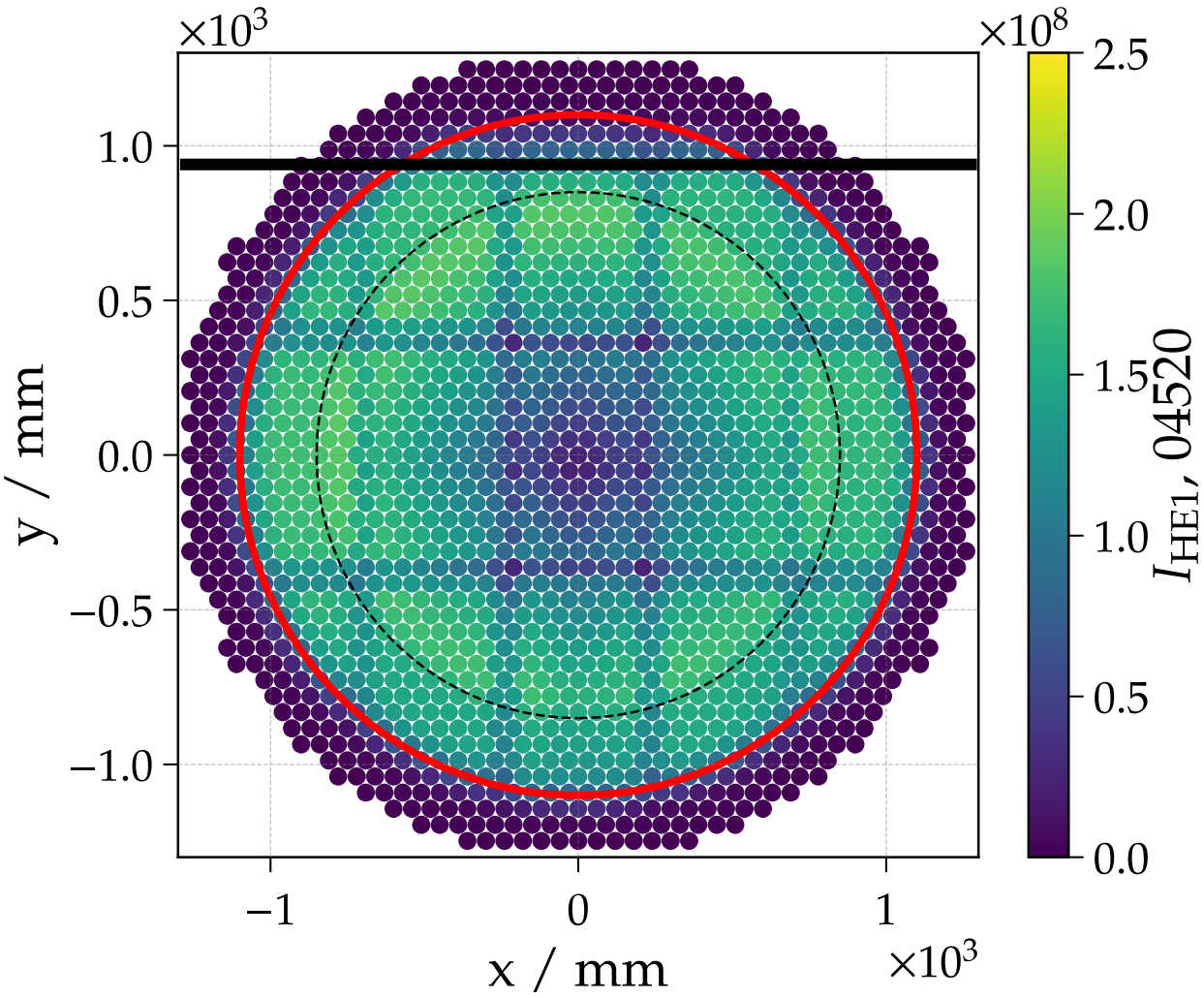


Posiotion: (0.0, 1039.0), HE1/HE2 = 0.219

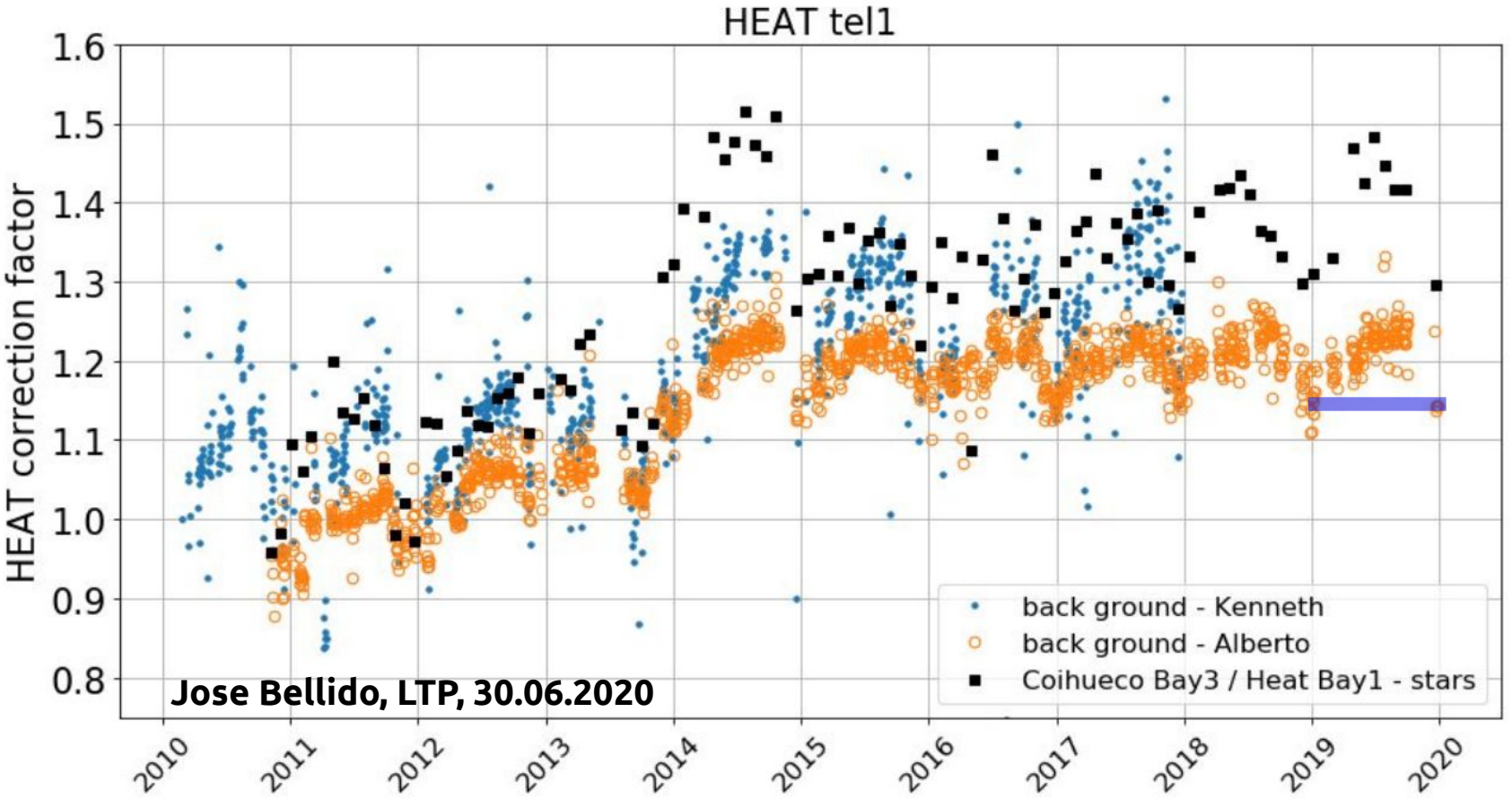


HEAT Shadow

- All HEAT telescope building should be constructed identical
- Problem with the curtain
  - According to Primo the curtain of HE1 is ~25 cm lower than it is supposed to be
  - Rough estimate: 15 cm of top aperture obscured
    - $A_{obscured} / A_{Aperture} \approx 0.03$



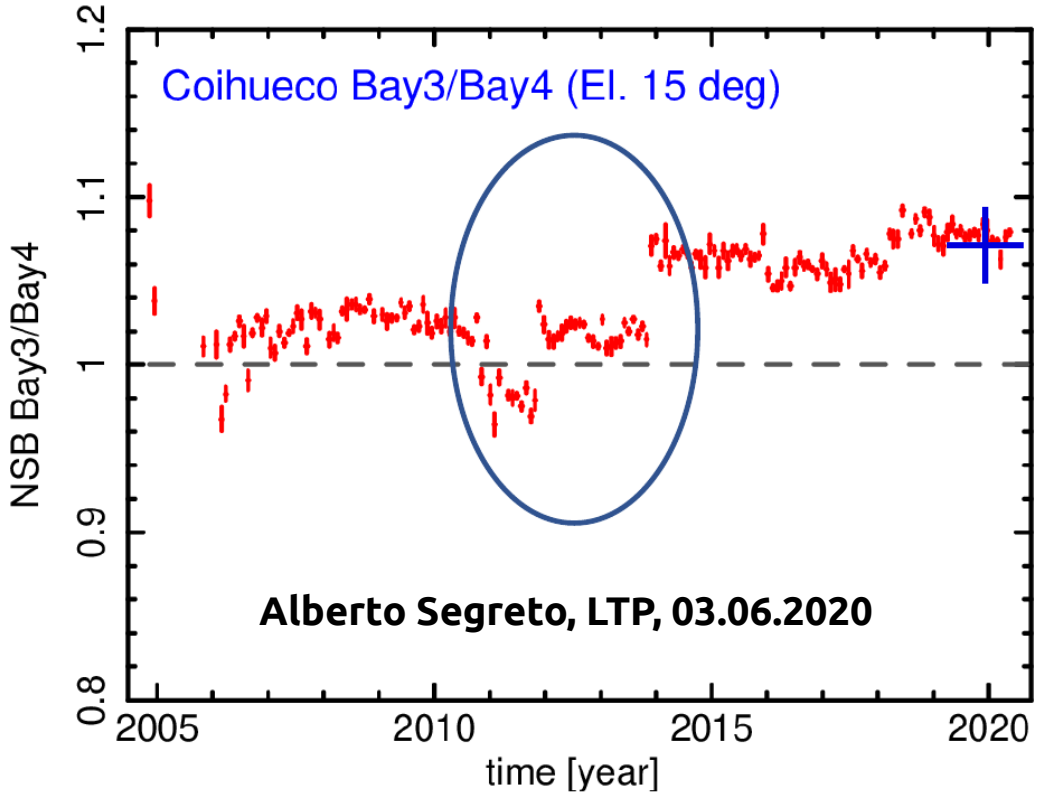
HEAT Correction Factor

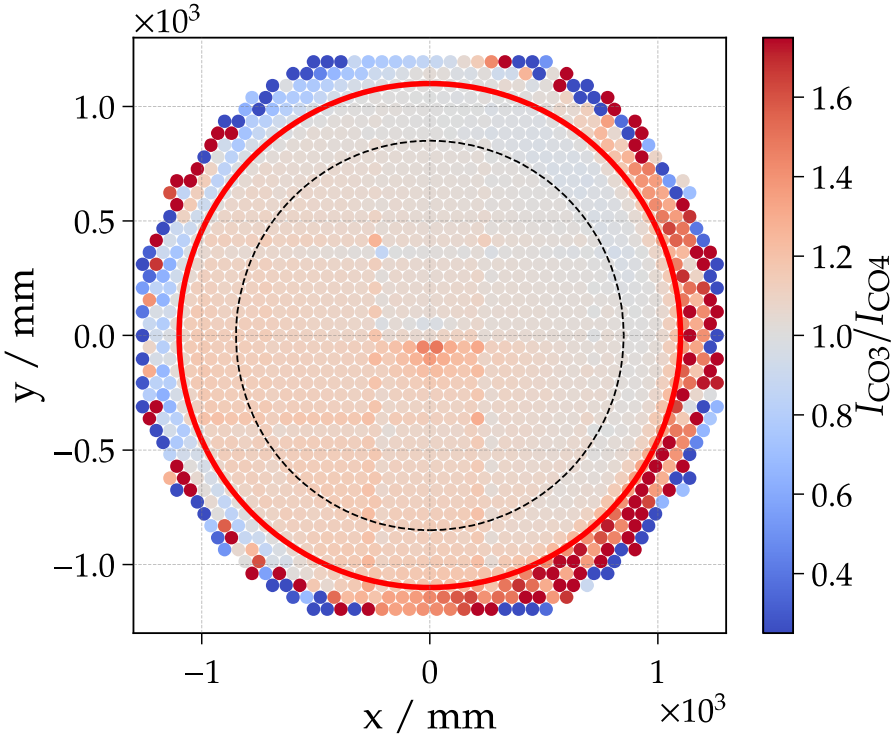


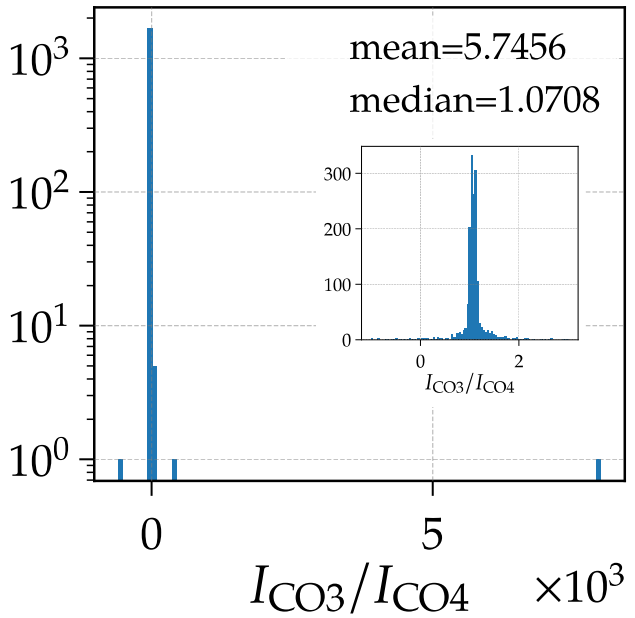
- **Co3 / HE1 from XY scanner**
  - **March 2019: 1.146 (KIT sphere)**
  - **November 2019: 1.144 (KIT sphere)**
  - **November 2019: 1.154 (Olomouc sphere)**

CO3 / CO4

- **Comparison of the XY measurements with diffuse NSB analysis**
- **XY scans from Nov 2019**
- **Work in progress**

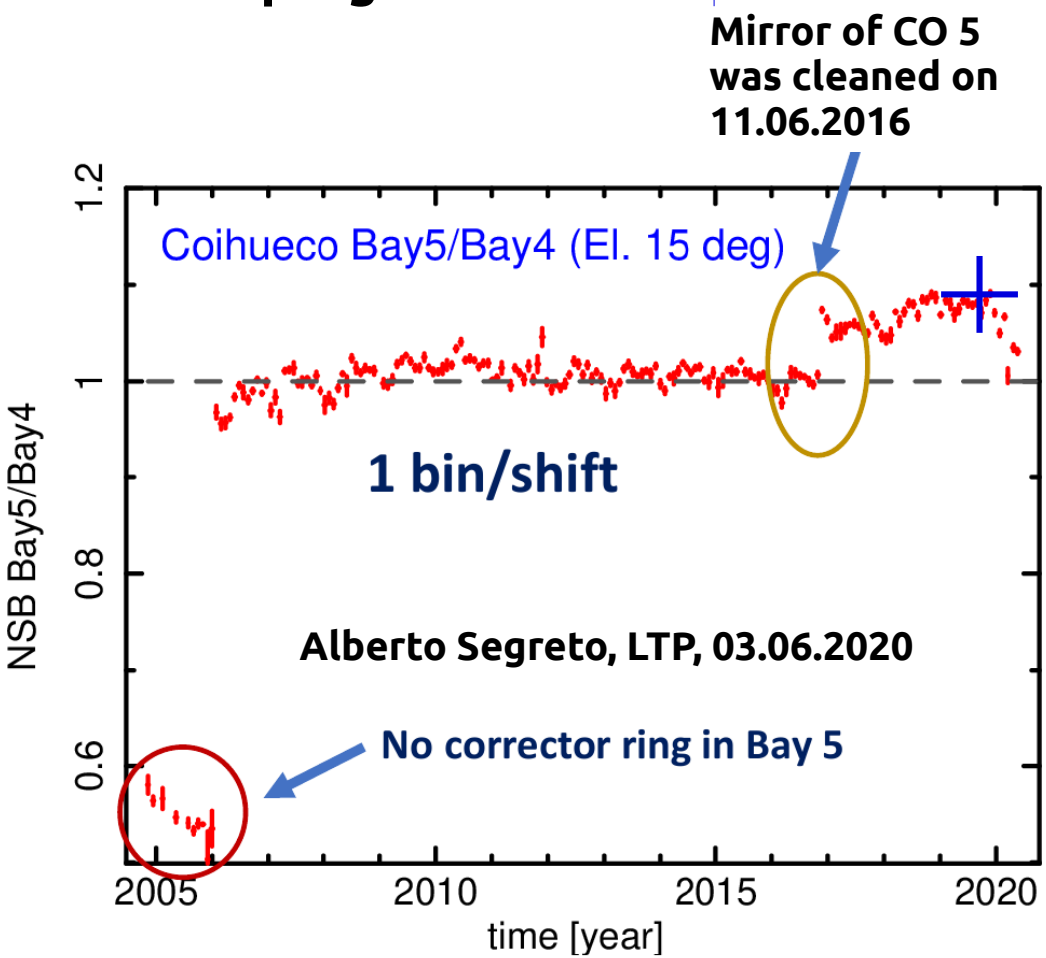


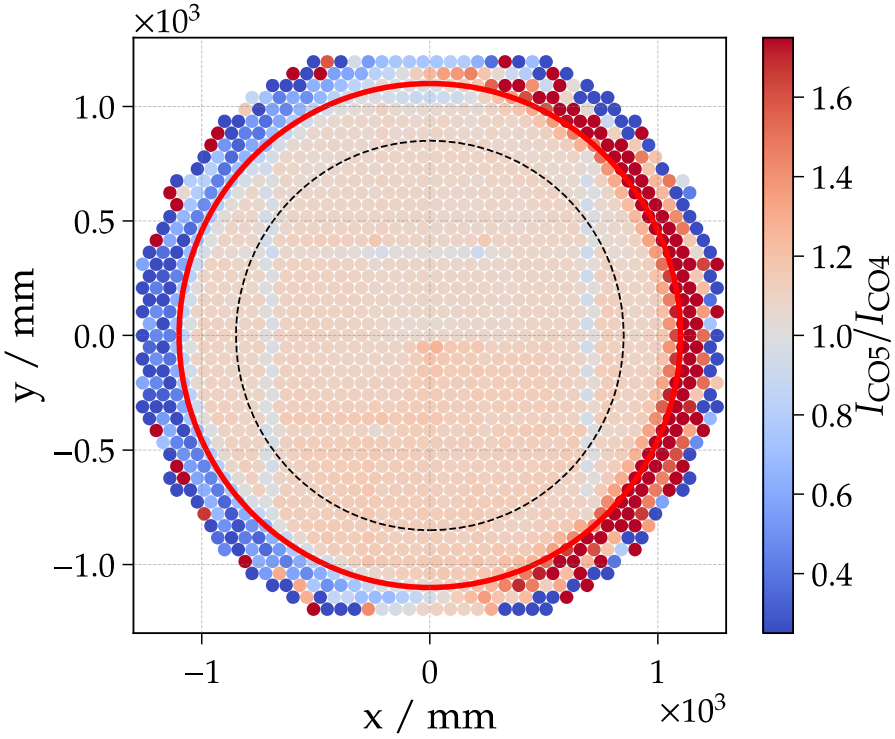


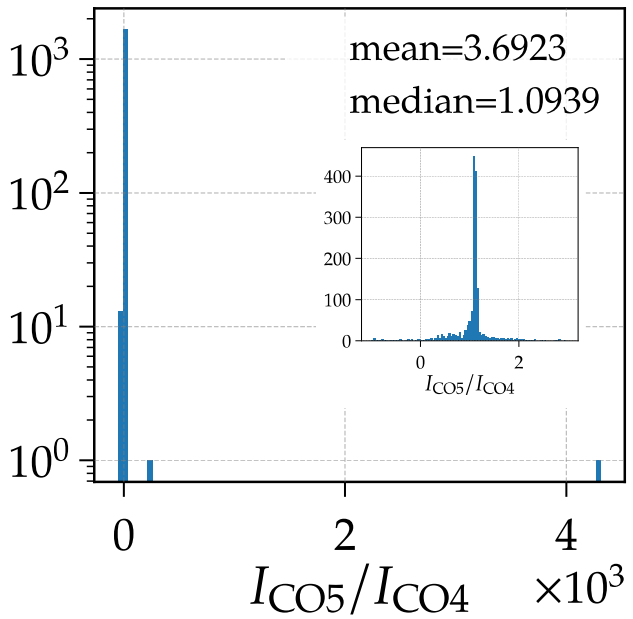


CO5 / CO4

- Comparison of the XY measurements with diffuse NSB analysis
- XY scans from Nov 2019
- Work in progress







Conclusion & Outlook

- Curtain of HEAT telescope 1 is ~25 cm lower than supposed
  - Reducing the aperture by ~ 3%
- XY cross-calib results compatible with NSB analysis
  - Work in progress
  - Cross calibration between other/more telescopes

Event from Central Position