

HEROES Pointing Analysis

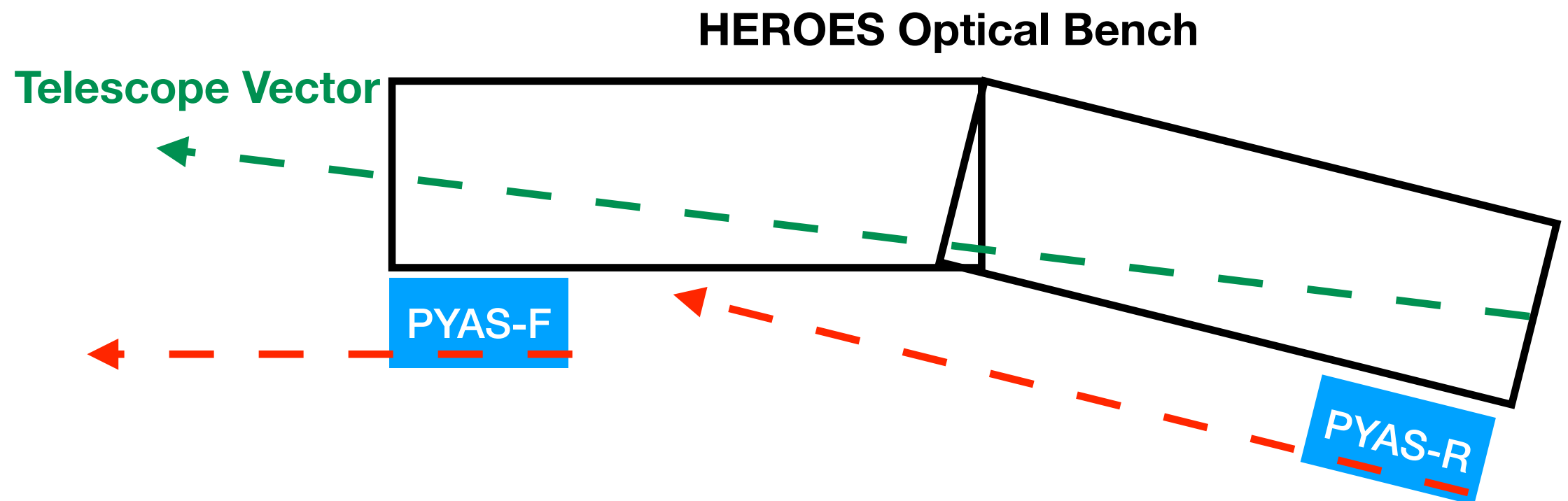
Dan Ryan & Albert Shih
GSFC

Motivation

- Initial analysis of HEROES observations did not reveal signal from B-class flare known to have occurred during flight.
- Pointing for photon tagging was calculated roughly and may have prevented signal being detected.
- Two potential sources of pointing error...

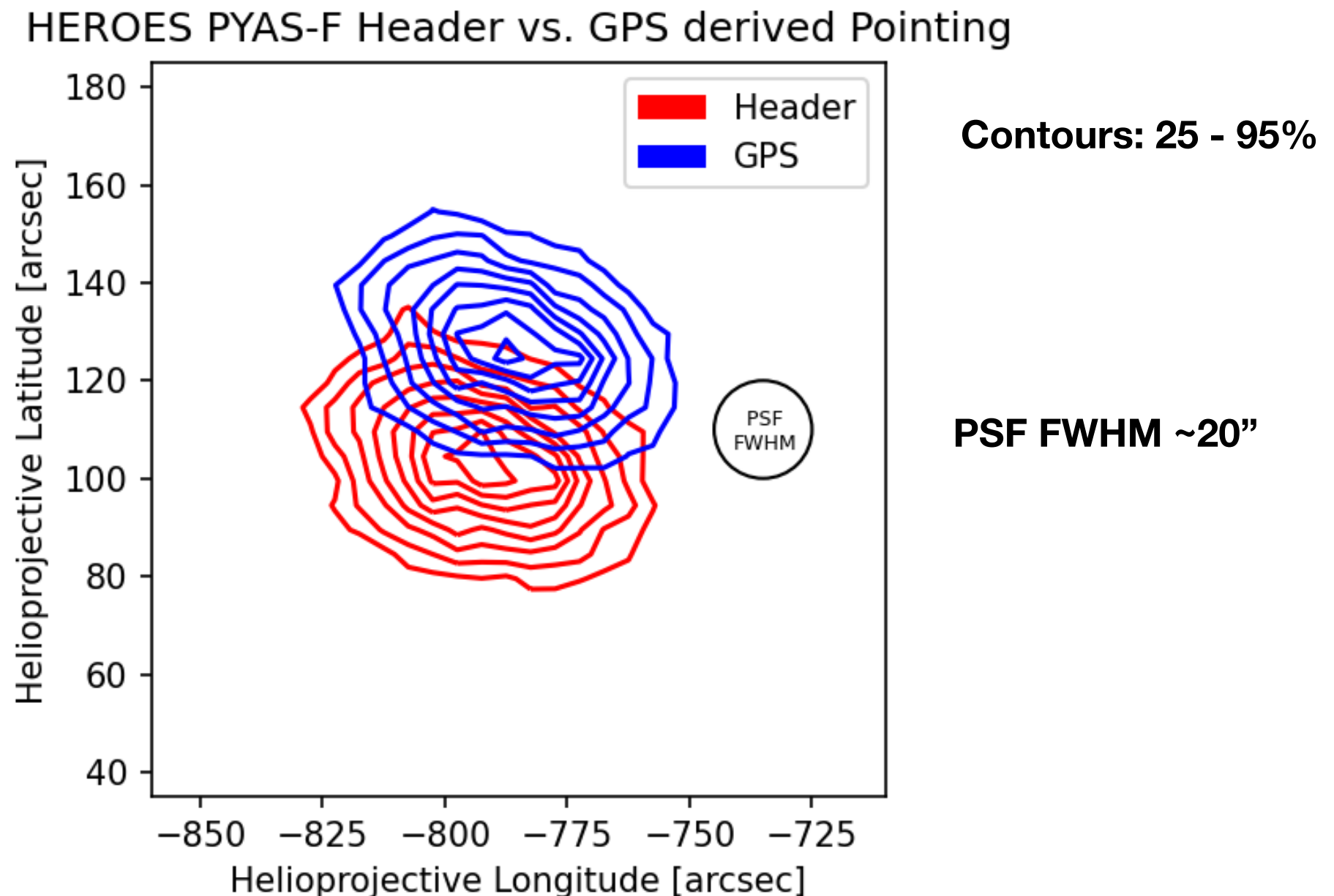
Sources of Pointing Error

- **Full GPS information not used to calculate balloon positions.**
 - Arbitrary fixed height initially assumed in header.
- **Telescope pointing vector not calculated.**
 - PYAS-F pointing used in initial analysis.
 - Gravity-induced bend halfway along optical bench would cause telescope pointing to be average of PYAS-F and PYAS-R pointing.



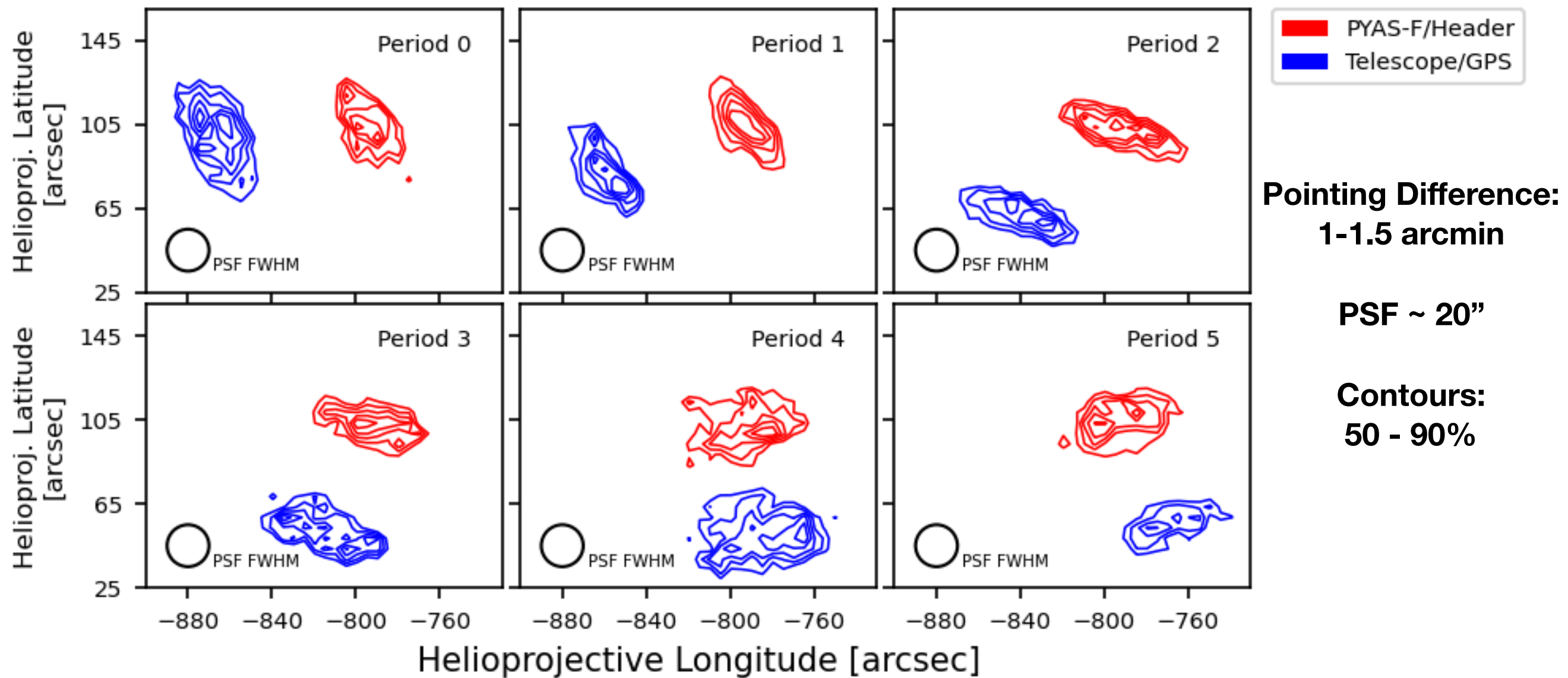
Header-derived vs GPS-derived Balloon Position

- Pointing Difference (22-27") slightly more than PSF.



Header-derived Position + PYAS-F Vector vs GPS-derived Position + Telescope Vector

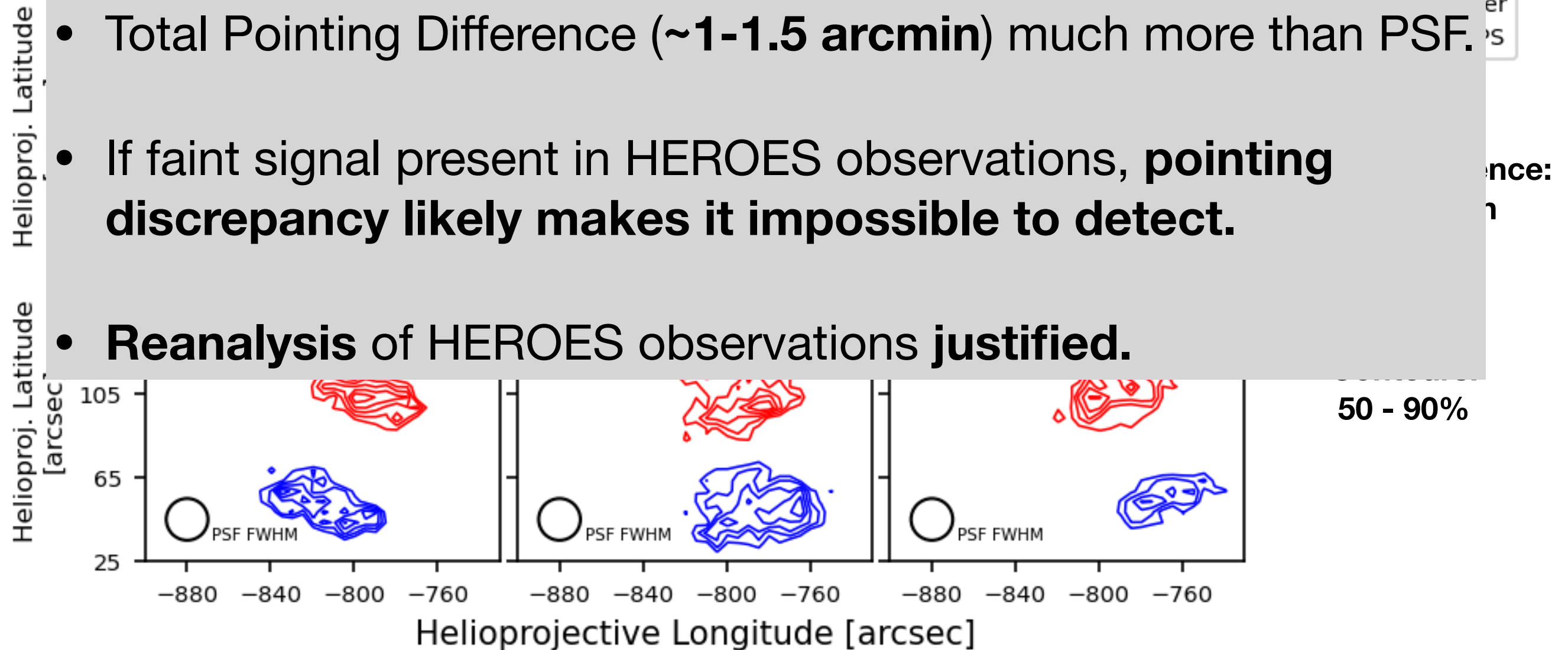
HEROES Telescope/GPS vs. PYAS-F/Header Pointing



Header-derived Position + PYAS-F Vector VS GPS-derived Position + Telescope Vector

HEROES Telescope/GPS vs. PYAS-F/Header Pointing

- Total Pointing Difference (**~1-1.5 arcmin**) much more than PSF.
- If faint signal present in HEROES observations, **pointing discrepancy likely makes it impossible to detect.**
- **Reanalysis** of HEROES observations **justified.**



Header-derived Position + PYAS-F Vector VS GPS-derived Position + Telescope Vector

