Status of the VERITAS Stellar Intensity Interferometer (VSII)

- Excellent instrument for SII : *sub-milliarcsecond resolution*
- Large photon collection area (~12 m Ø mirrors)
- 40 m to 175m baselines
- Optically isochronous (< 4 ns)
- Telescope time available during Full Moon

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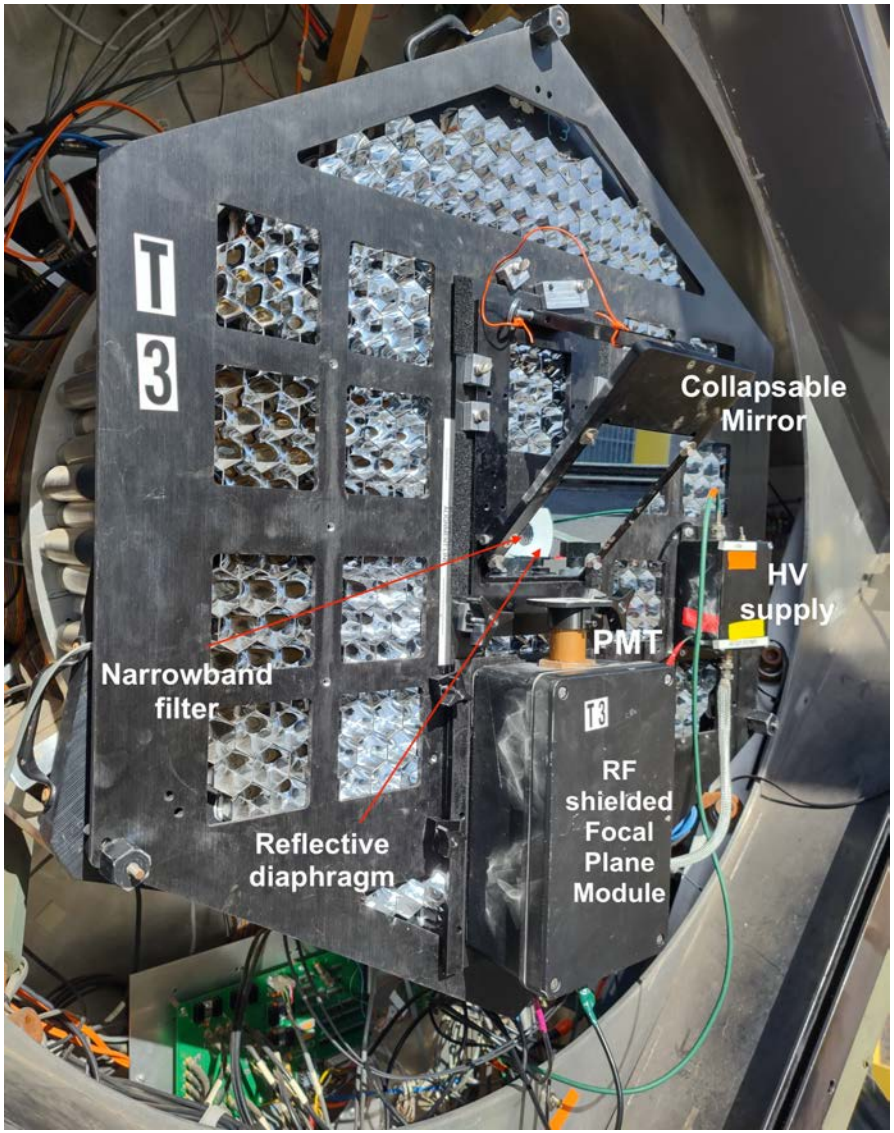
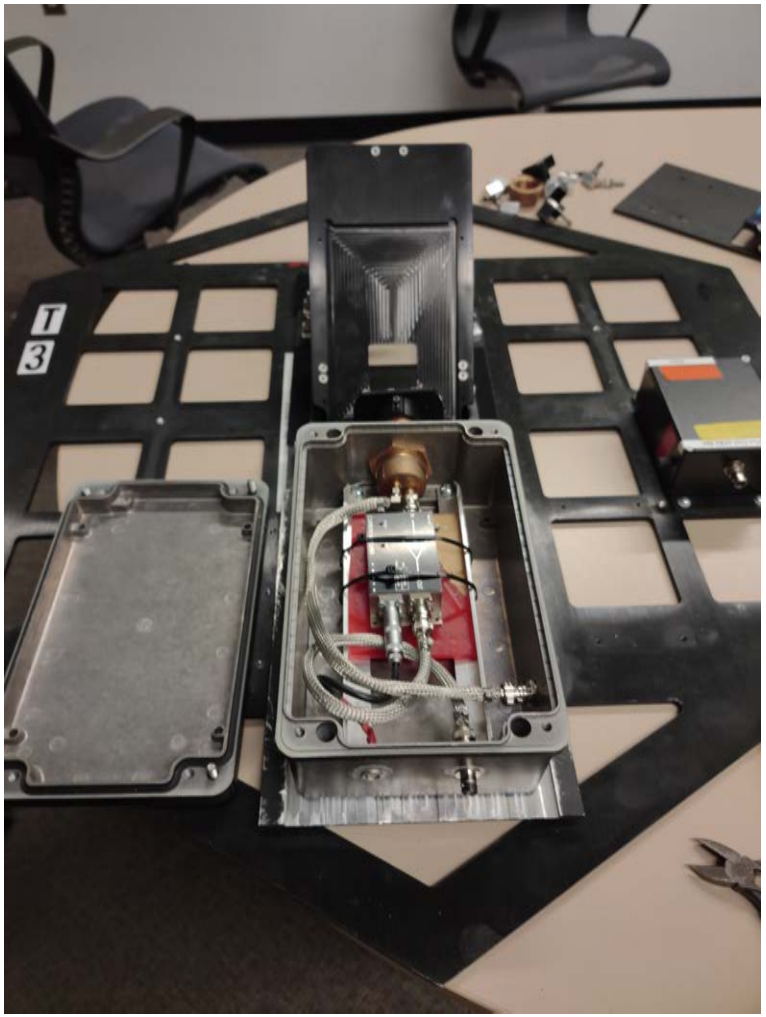
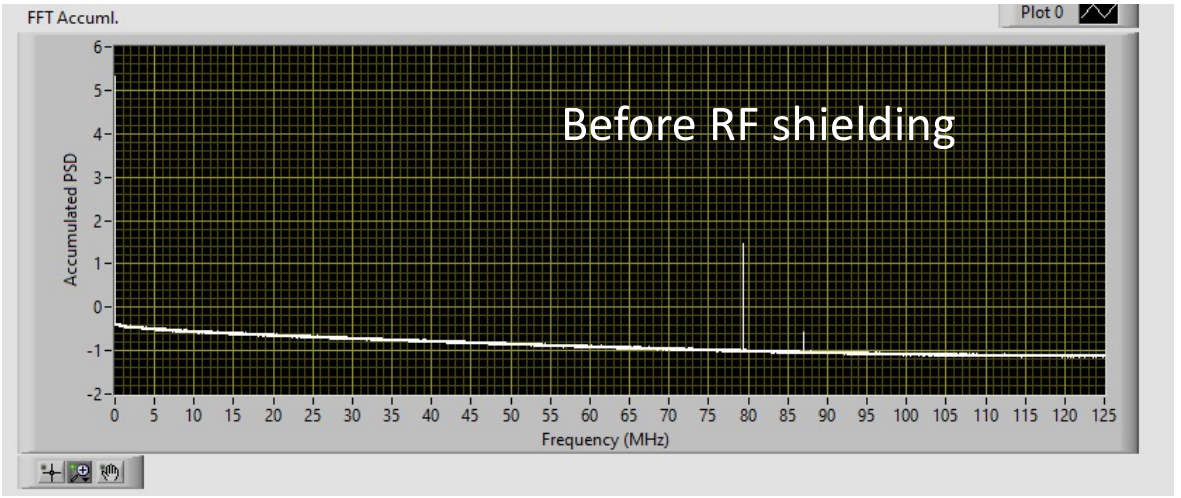
Removable SII Camera Plates

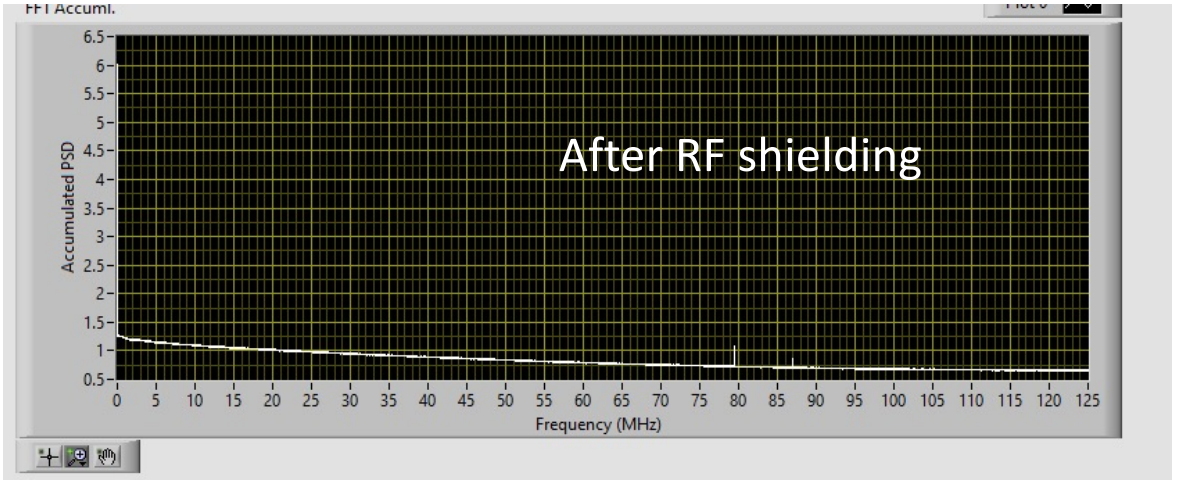


- The removable SII Camera Plate mounts in front of the VERITAS Camera focal plane.
- Observer locates the SII Plate onto each camera at beginning of full-moon period.
- Plate contains necessary focal plane optics, HV supply, photomultiplier and preamplifiers to perform SII measurements.
- Quick connect to cables for signal, power, control
- At end of run the SII plate is removed and stored in dust-proof box.
- About 20 minutes to install each plate

Recent Improvements (Dec 2020)

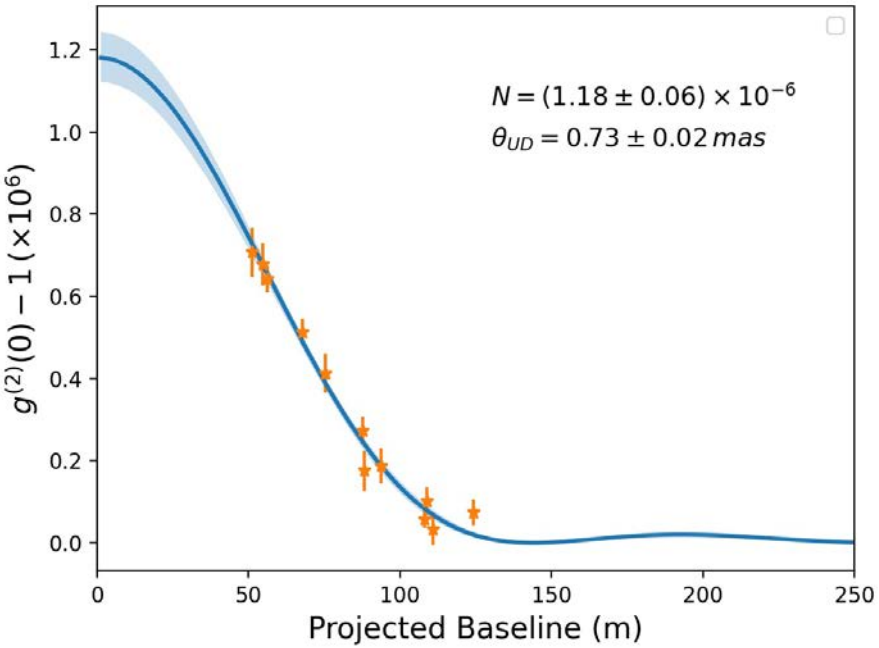




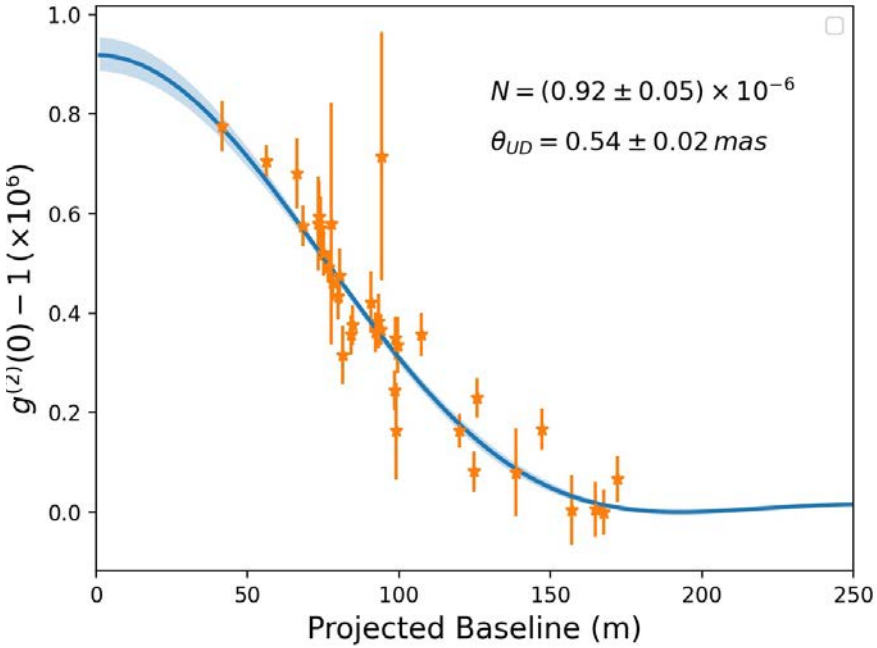


- About factor of 8 reduction in RF Noise
- Applied to all four SII telescopes (February 2021)

Stellar Visibility curves (preliminary analysis)



gam ori, 20210331

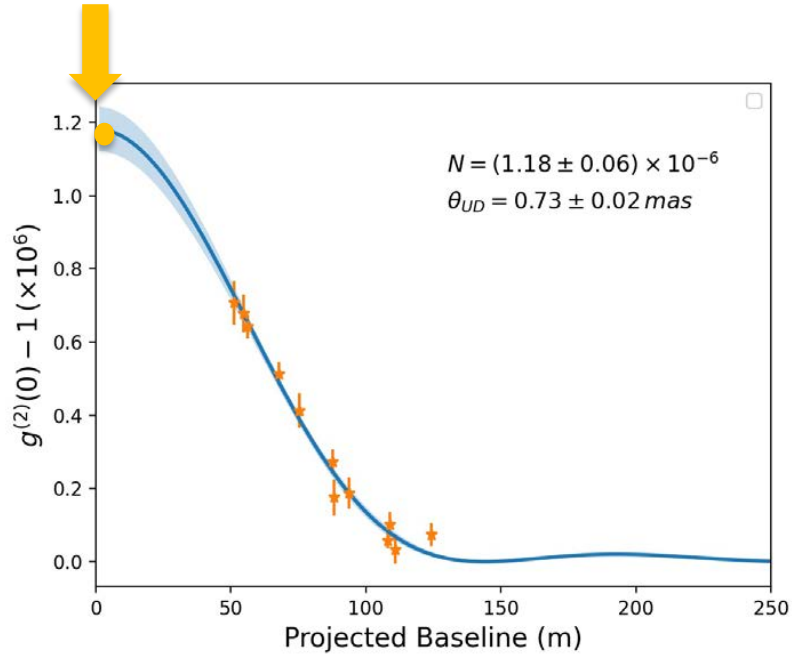


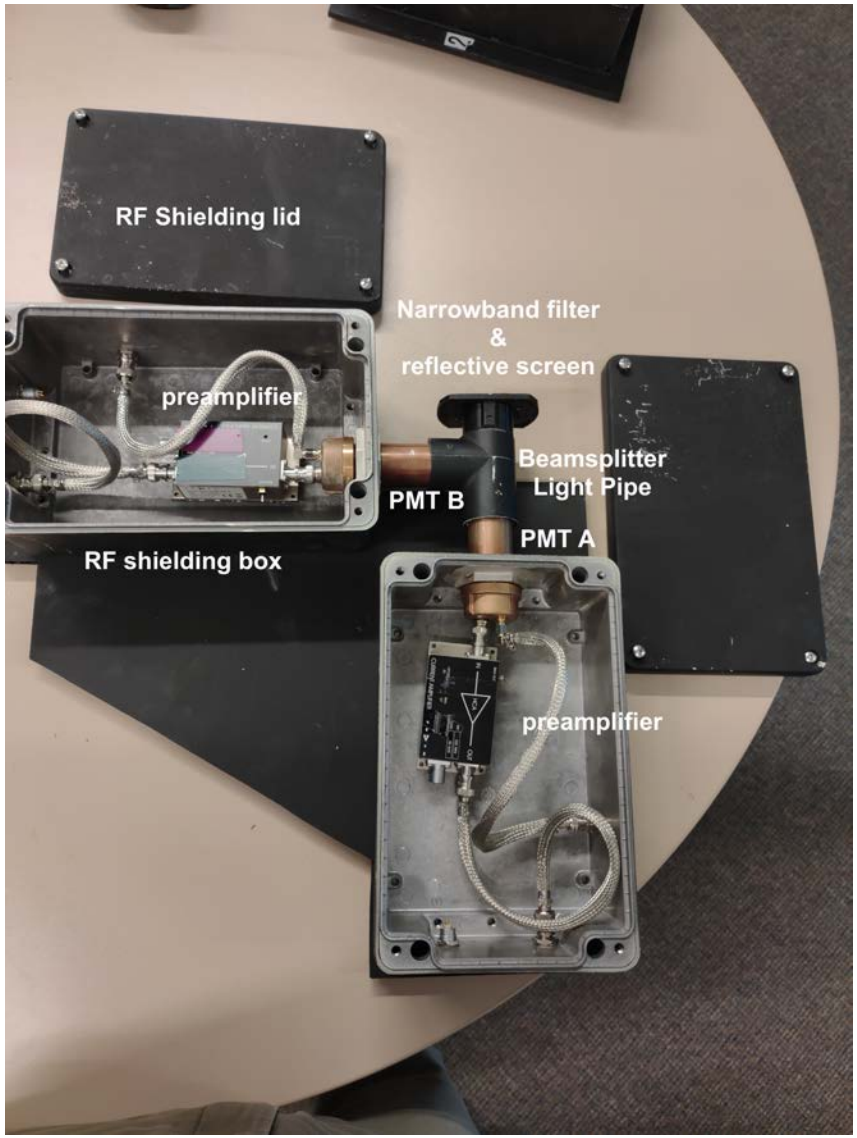
bet cma, 20201230

< 5 % resolution in stellar diameter for bright stars/ 3-5 hour exposure.

Zero Baseline Upgrade

- Add constraint to visibility curve at zero baseline : improved fits
- Add beam splitter to T1 (T0/T1 on single focal plane)
- Single optical bandpass filter
- Installed and commissioned (June 2021)





Looking Forward (Fall 2021 & beyond)

- Increase disk space to 100 TB (each telescope): > 500 TB total
- RF shielded cables for each telescope
- VERITAS mirror recoating
- Improved optical collimation & star tracking
- Moving Analysis from 5% to <1% systematics