

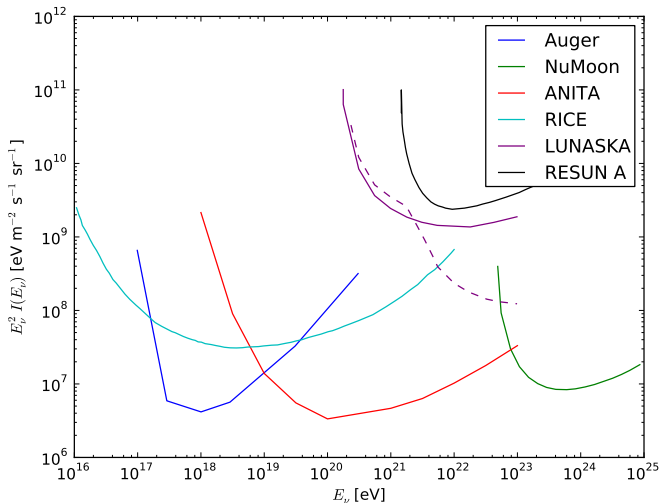
LUNASKA Lunar Cherenkov Observations



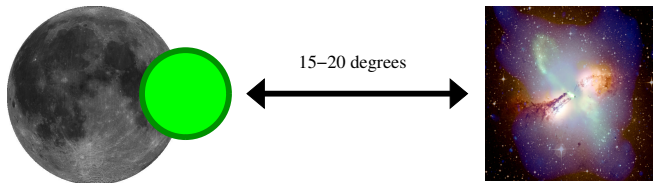
LUNASKA collaboration

Ron Ekers, Ray Protheroe,
Clancy James, Paul Roberts,
John Reynolds, Chris Phillips,
Rebecca Mcfadden, Jaime
Alvarez-Muñiz, Justin Bray

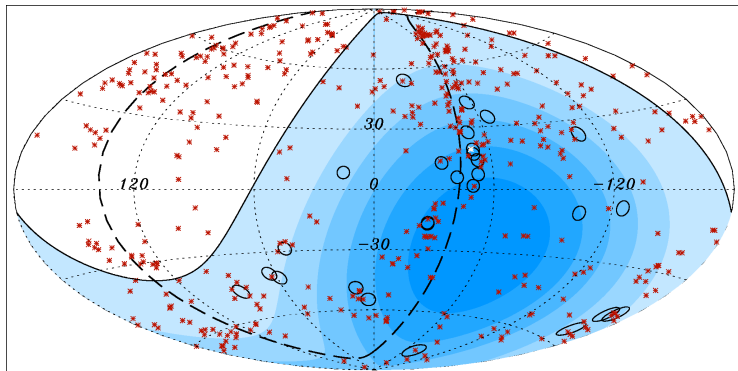
Isotropic limits



Directionality of sensitivity

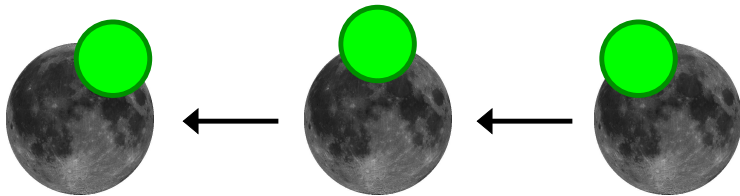


Target: Centaurus A



Pierre Auger Observatory: skymap of UHECR events

Continuous targeting



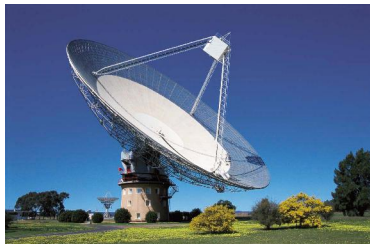
Continuous targeting

ATCA



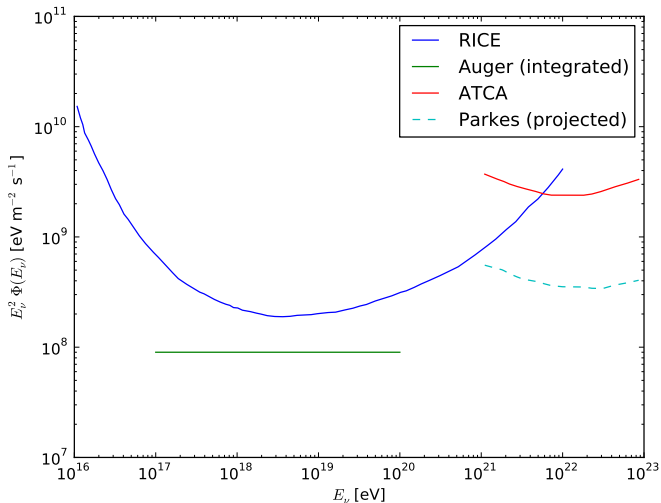
- ▶ Observations in 2008
- ▶ 20 hours
- ▶ Analysed: see James et al.

Parkes

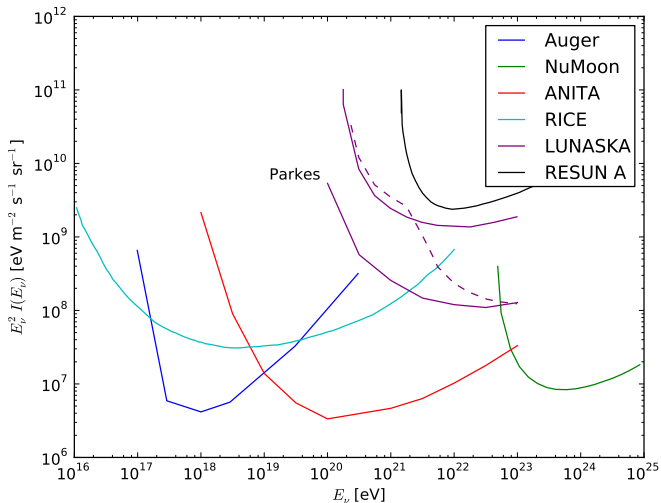


- ▶ Observations in 2010.
- ▶ 250 hours
- ▶ Ongoing

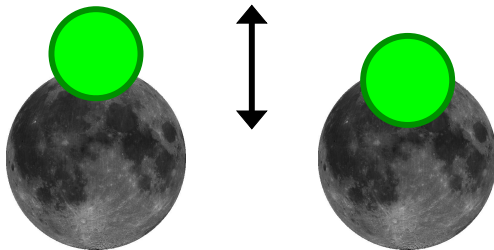
Directional limit to Centaurus A



Isotropic limits again



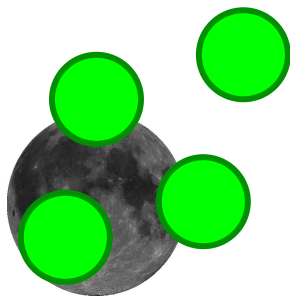
Pointing



More sensitive

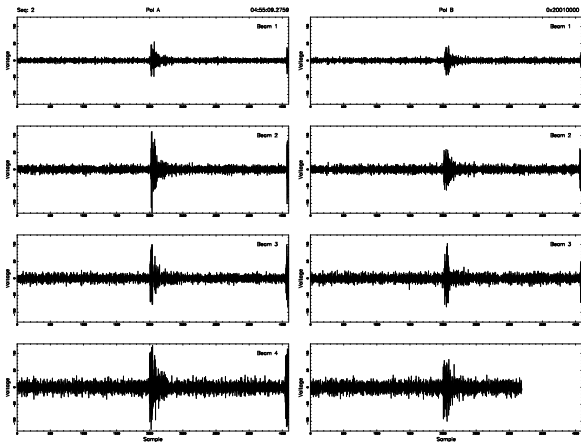
See more of moon

Multibeam

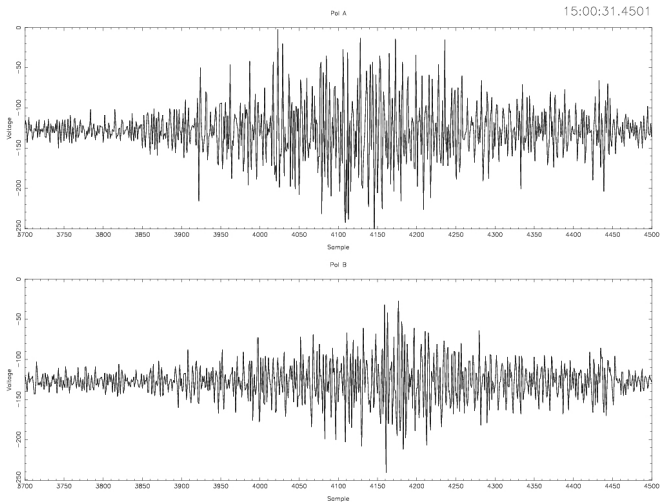


- ▶ Anti-coincidence RFI rejection

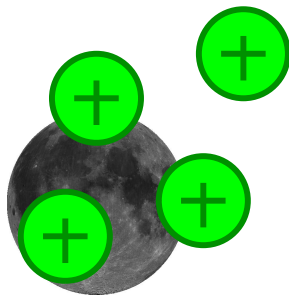
RFI rejection



RFI: lightning

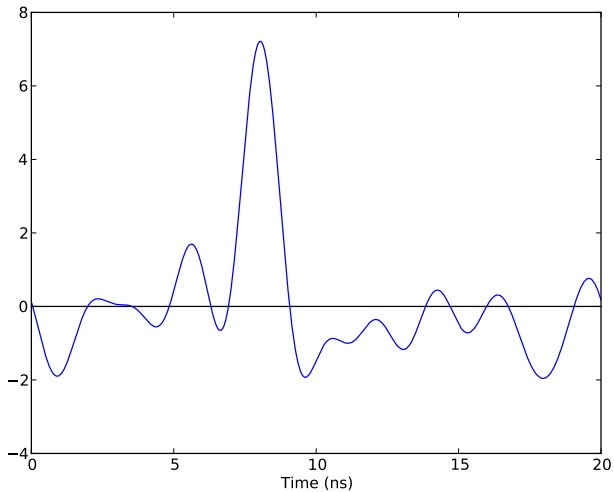


Multibeam polarisation

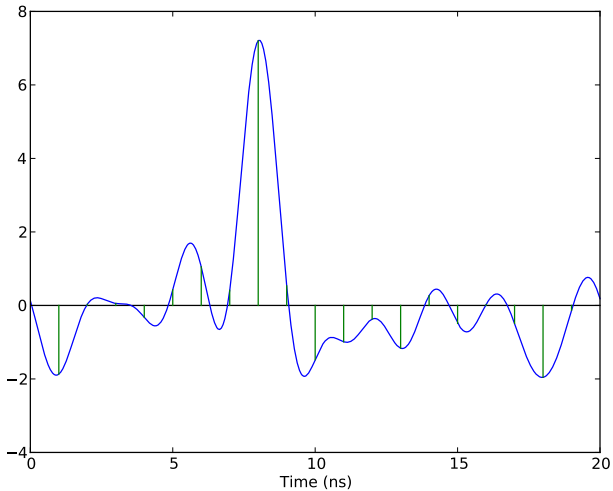


- ▶ Anti-coincidence RFI rejection
- ▶ Radial polarisation

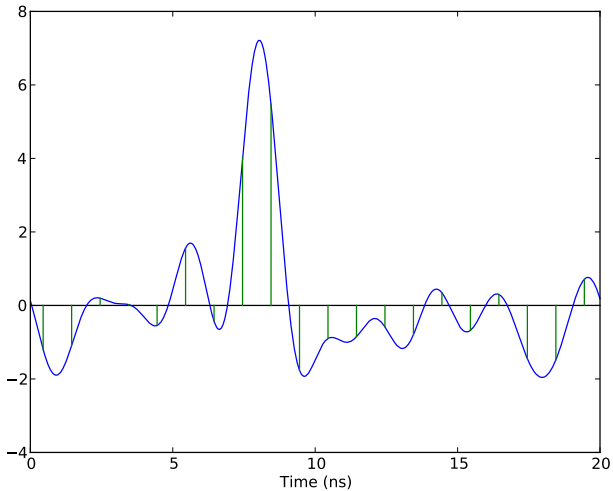
Triggering



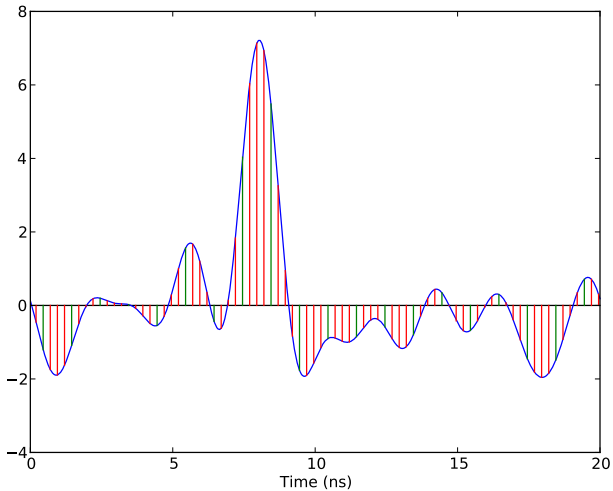
Triggering: Sampling



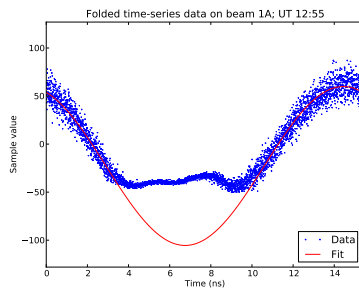
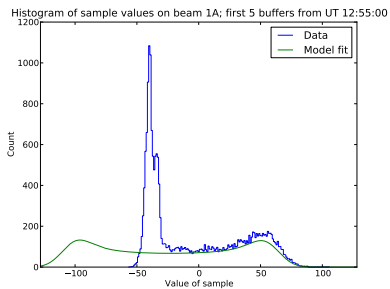
Triggering: Sampling



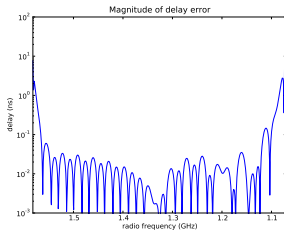
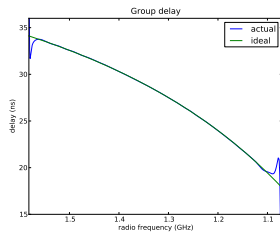
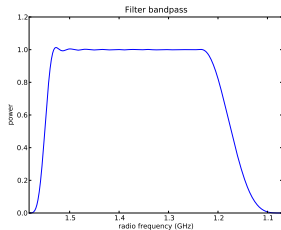
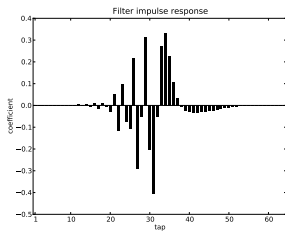
Triggering: Interpolation



Linearity



Dedispersion



Processing

Realtime

- ▶ Interpolation
- ▶ Dedispersion
- ▶ RFI anticoincidence

Retrospective

- ▶ LO phase search
- ▶ Band shaping

Gratuitous hardware

