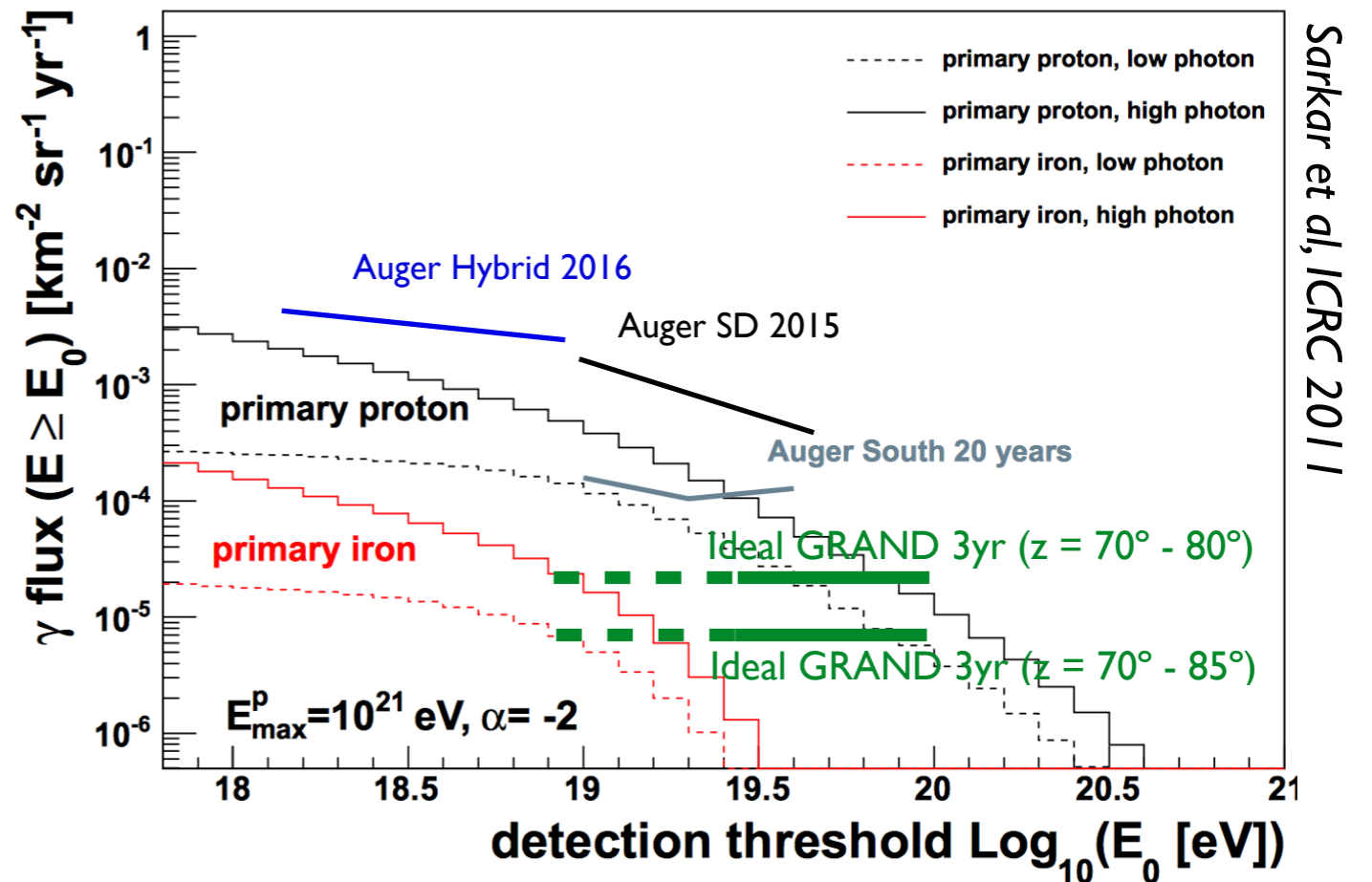
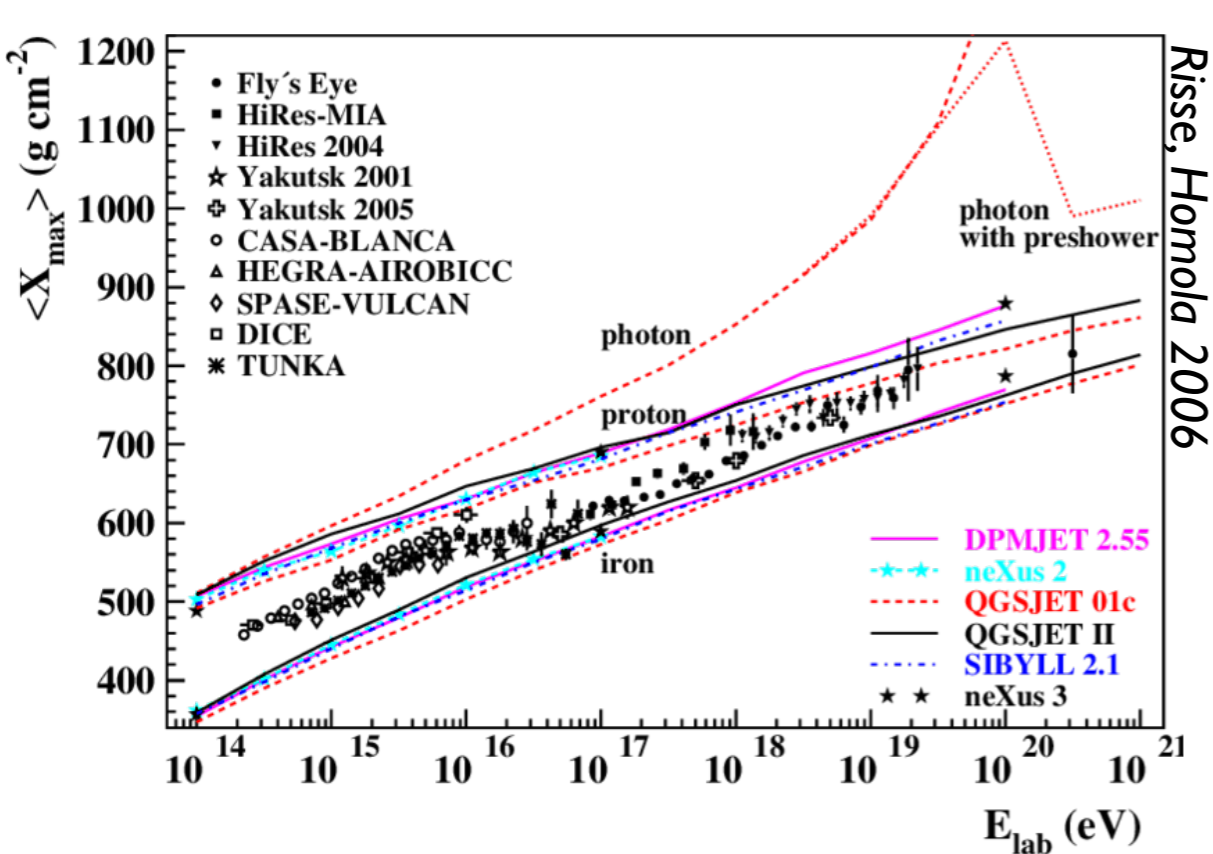
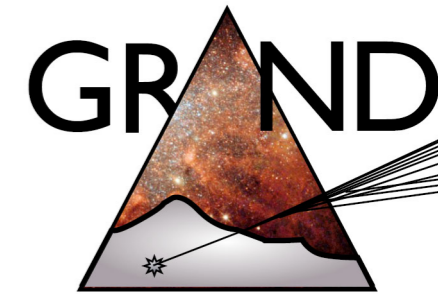


Ultra-high energy photons with



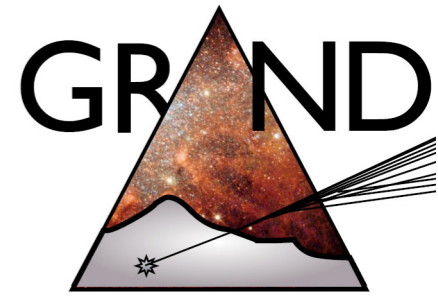
UHE photons in GRAND



200,000 km² GRAND

Assume diffuse spectrum follows $\sim E^{-2}$

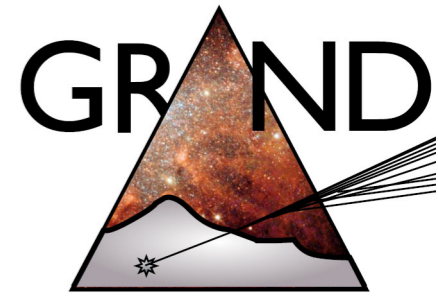
Practical points



What remains to be done

- State of the art
- Sensitivity
- Gamma-ray opacity of the Universe

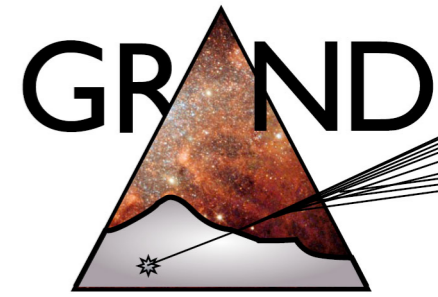
Practical points



What remains to be done

- **State of the art** - writing
- **Sensitivity** - preliminary calculations - need input from other sections
- **Gamma-ray opacity of the Universe** - define objective - decide on calc. plots

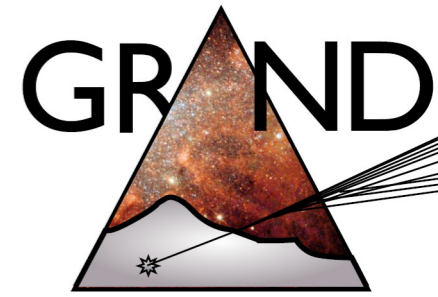
Practical points



What numbers/information do we need from other sections?

- ΔX_{\max}
- Energy range
- Energy resolution
- Angular resolution
- Zenith range / efficiency as function of θ

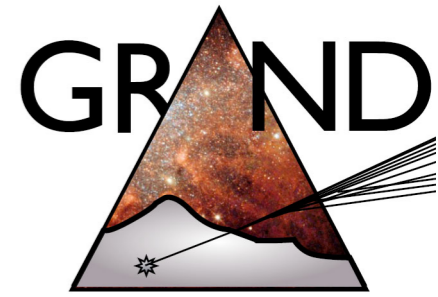
Practical points



What numbers/information do we need from other sections?

- $\Delta X_{\max} \sim 25 / 100 \text{ g cm}^{-2}$
- Energy range $\sim 10^{17} \text{ eV} - \text{inf}$
- Energy resolution $\sim 20\%$
- Angular resolution 0.1°
- Zenith range / efficiency as function of $\theta \sim 70^\circ - 80^\circ$

Practical points



What can be done during the workshop? / Timeline

- Preliminary exposure - (zenith dependence from Olivier?)
- Identify sources in FOV (e.g. Cen A/TeV Cat objects)
- Preliminary point source sensitivity of exciting sources
- X_{\max} at GRAND site (any CONEX experts?)
- Photon ID efficiency with $\Delta X_{\max} \sim 25 / 100 \text{ g cm}^{-2}$ / angular res.
- Come up with simulation needs
- Suggestions?