

Sharper Fermi-LAT Images

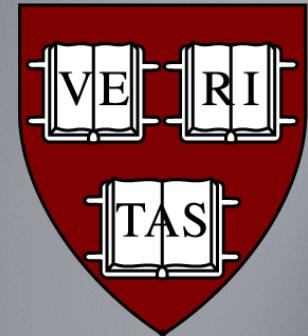
Stephen K N PORTILLO, Harvard University

with Douglas P FINKBEINER

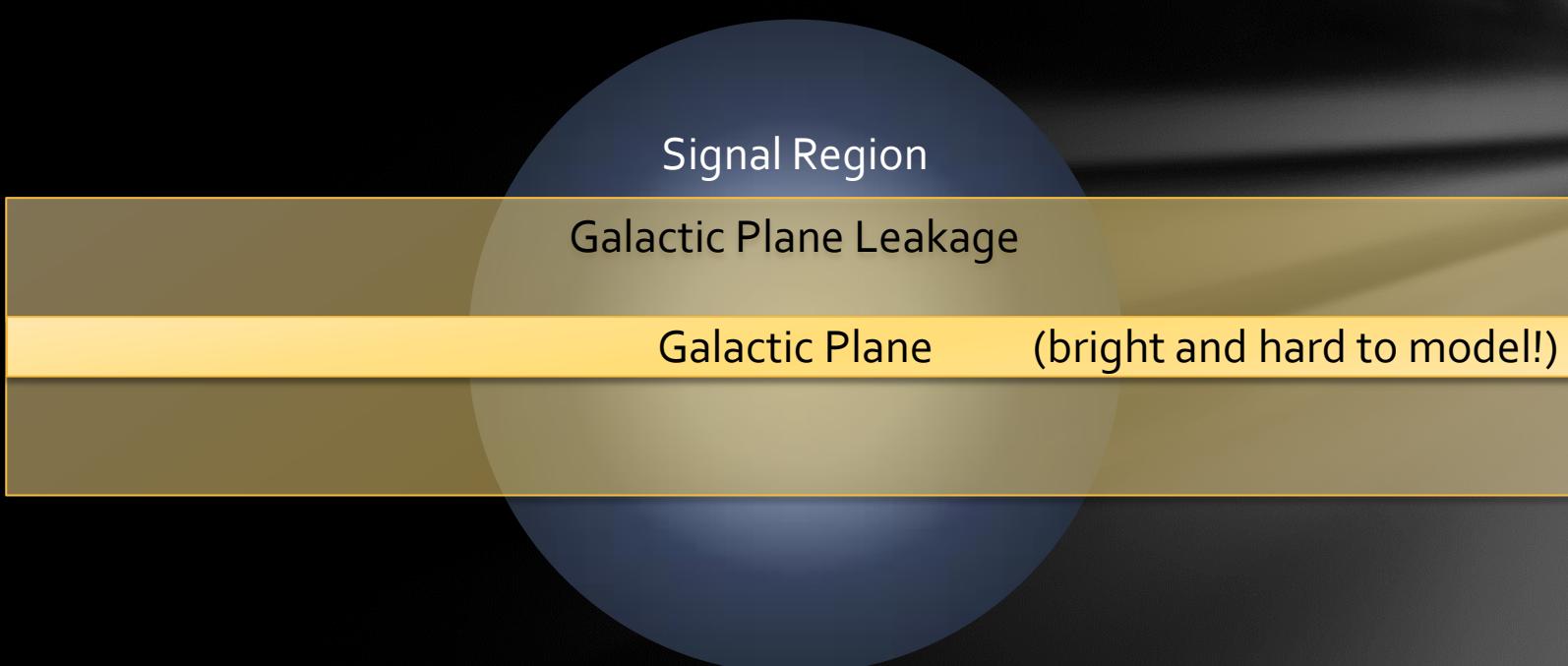
26 June 2014

Astroparticle Physics (TeVPA/IDM), Amsterdam

Portillo & Finkbeiner, 1406.0507
submitted to ApJ



Angular Resolution Matters



Signal Region

Galactic Plane Leakage

Galactic Plane (bright and hard to model!)

Point Spread Function

Multiple Coulomb scattering
in tungsten foils (low E)

tungsten
silicon

Ideal Event

Missed silicon hit

Limited silicon strip
position resolution (high E)

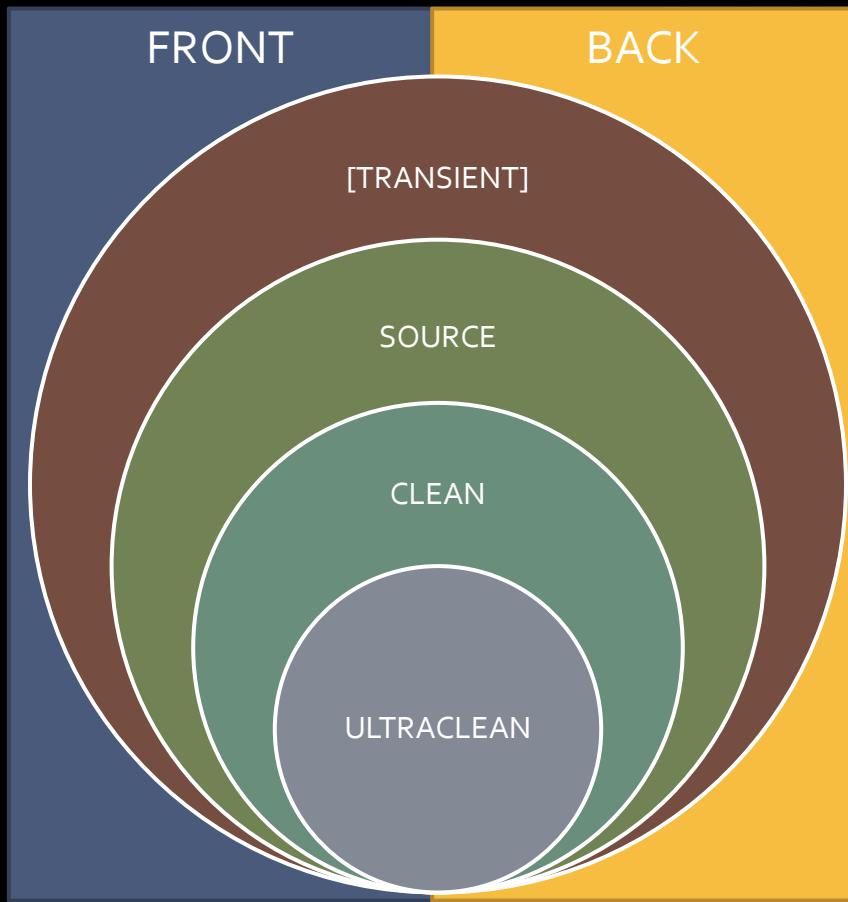
Unideal Event

Conversion in
support material

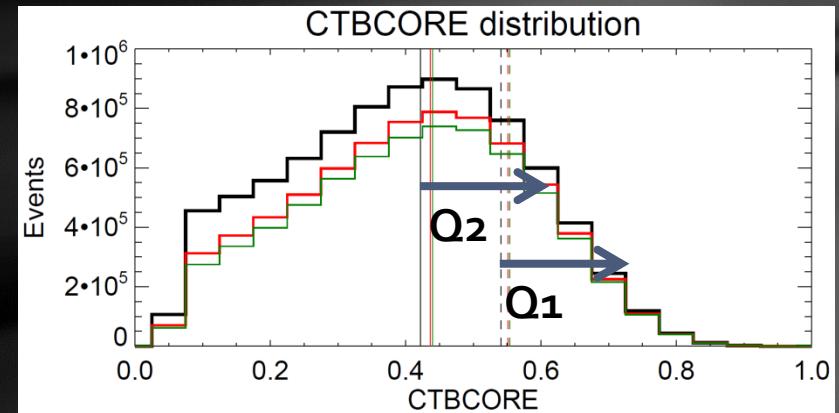
Hard scattering

Track confusion

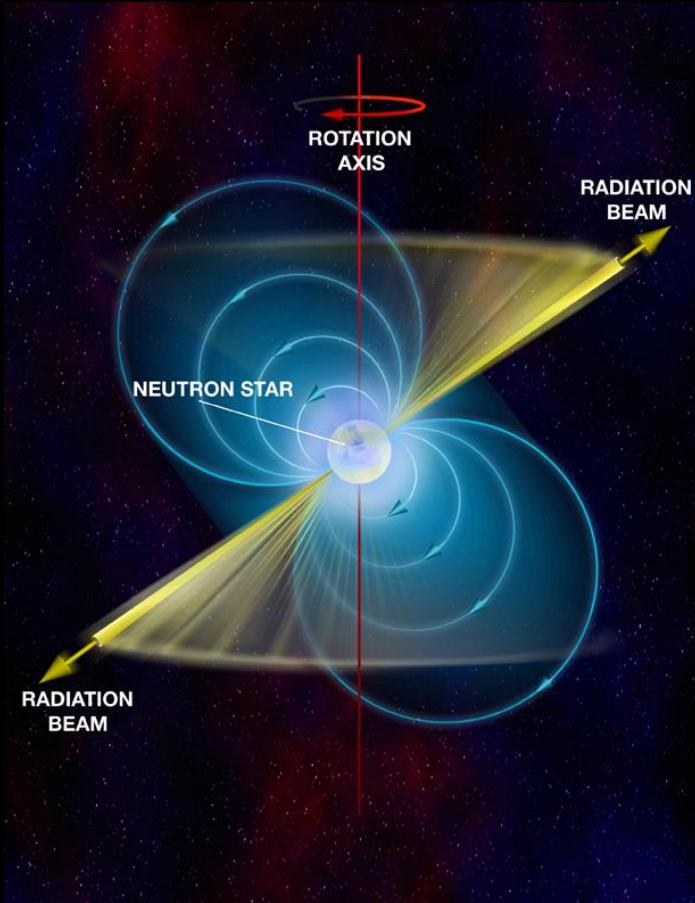
Event Classes + CTBCORE



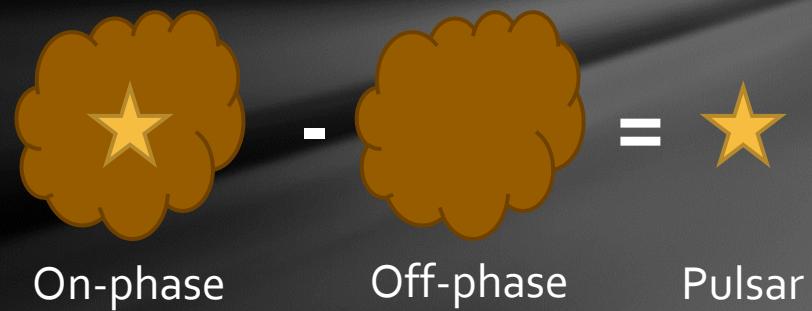
Dividing the front-converting events...



Pulsars as Point Sources

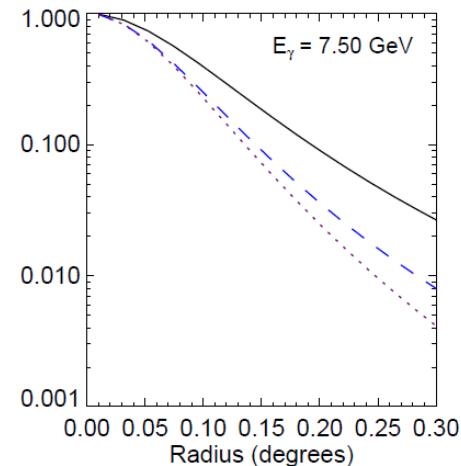
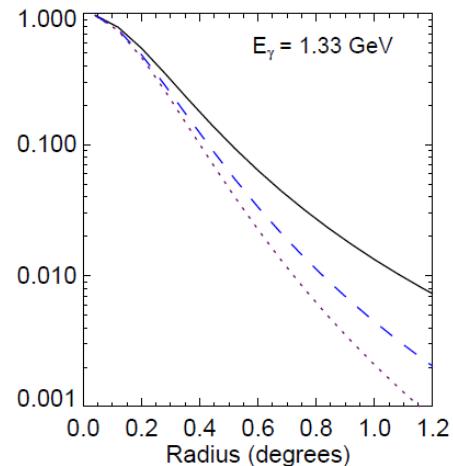
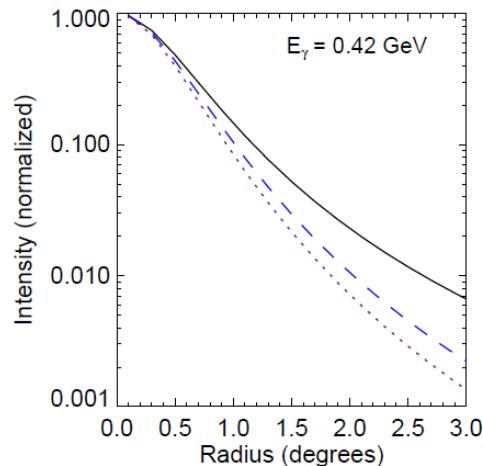
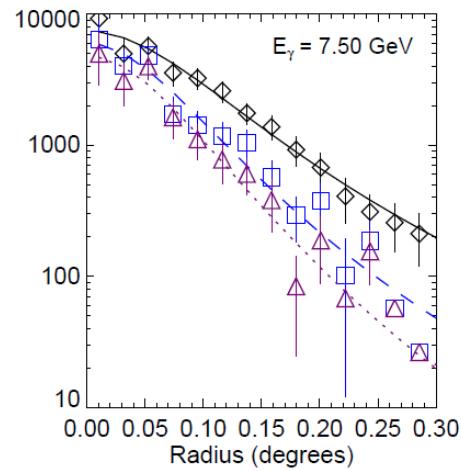
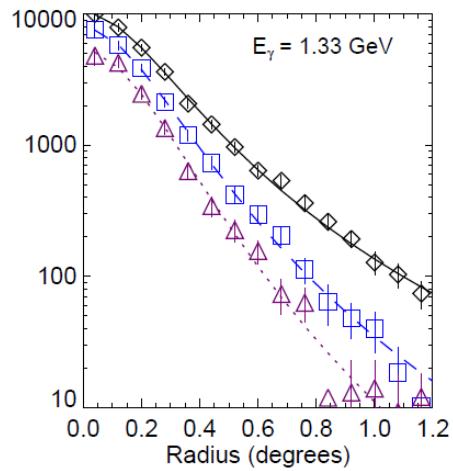
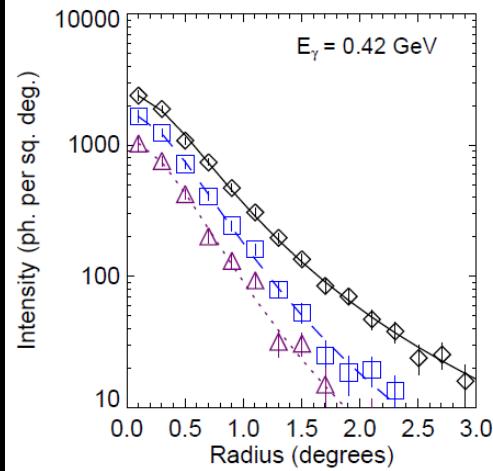


(Bill Saxton, NRAO)



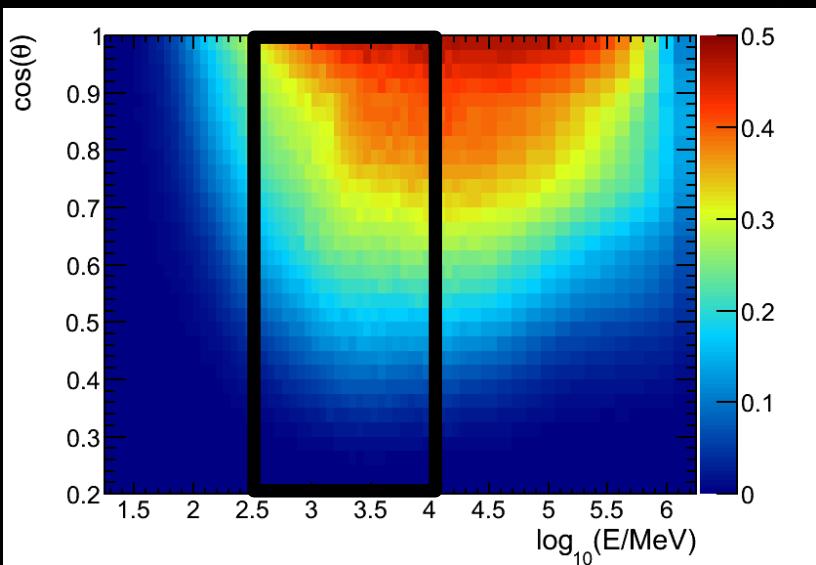
PSF Fitting

ULTRACLEAN: Allfront, Q₂, Q₁



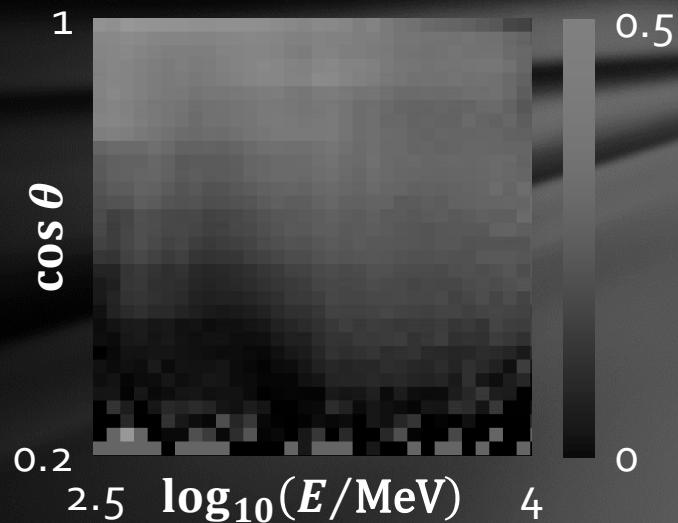
Effective Area

Surviving Fraction, CLEAN, Q₂

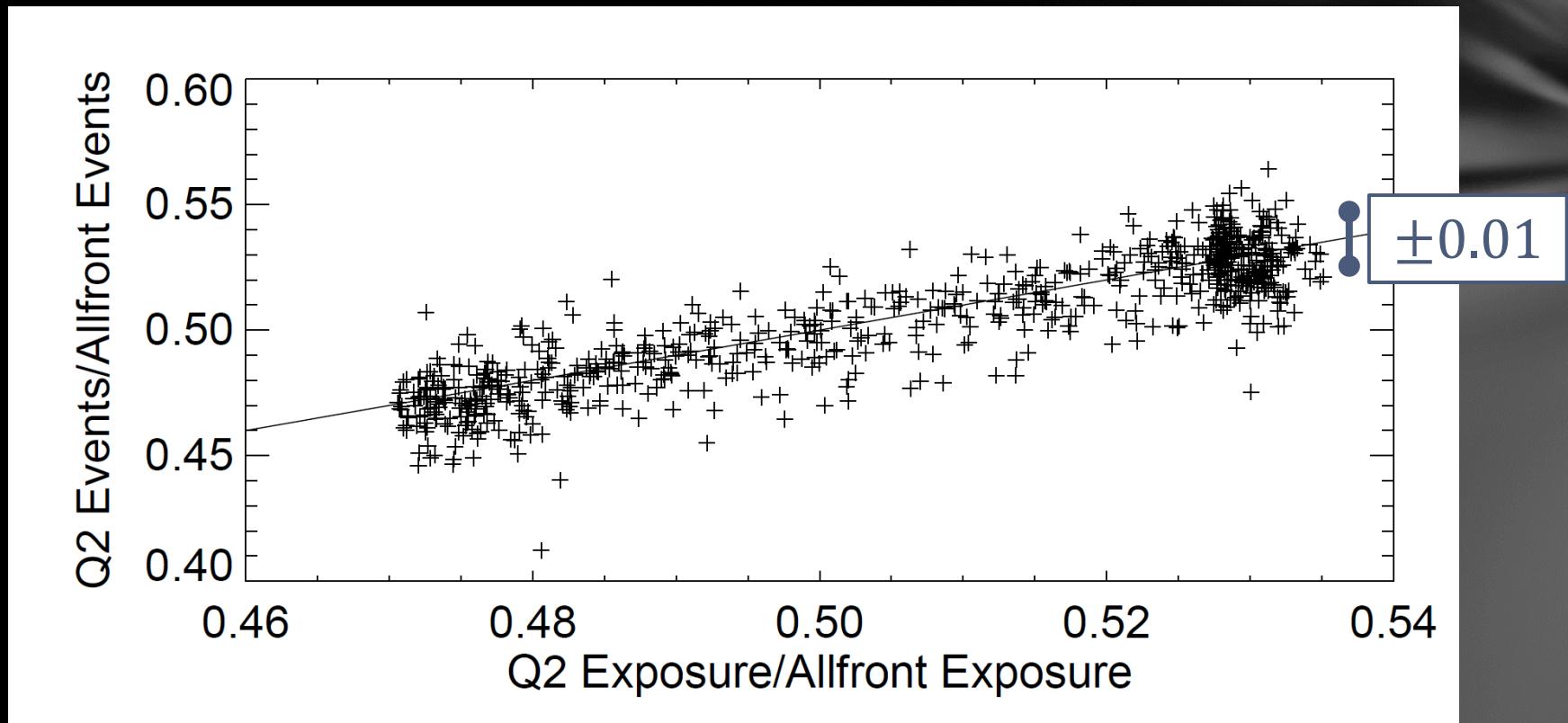


(Fermi Science Support Centre)

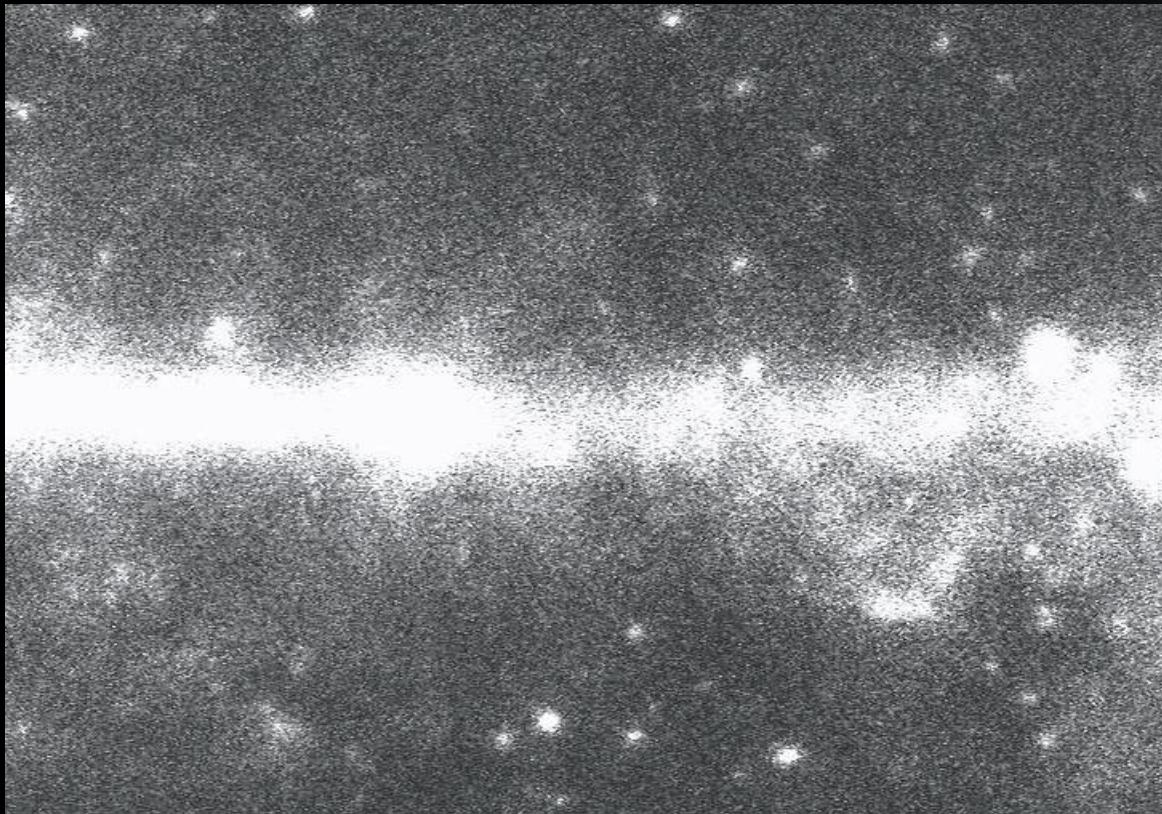
Effective Area, CLEAN (m²)



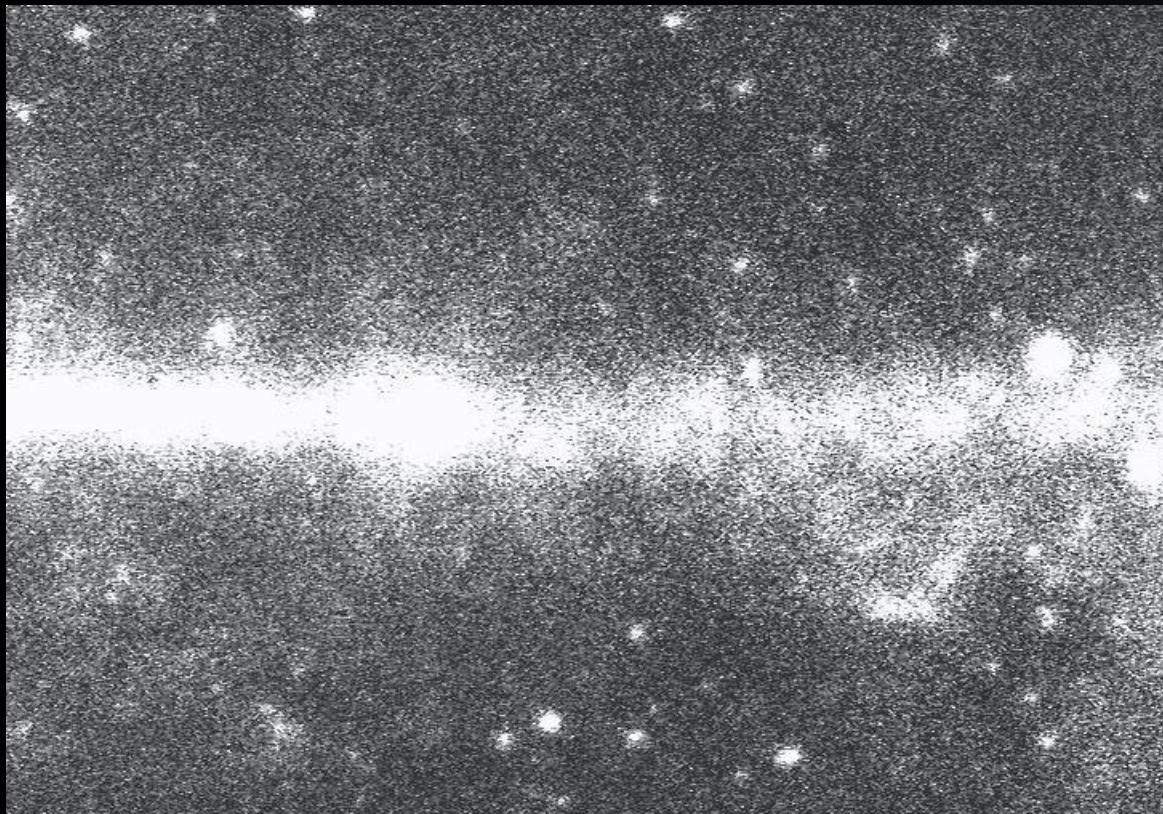
Effective Area Error Estimate



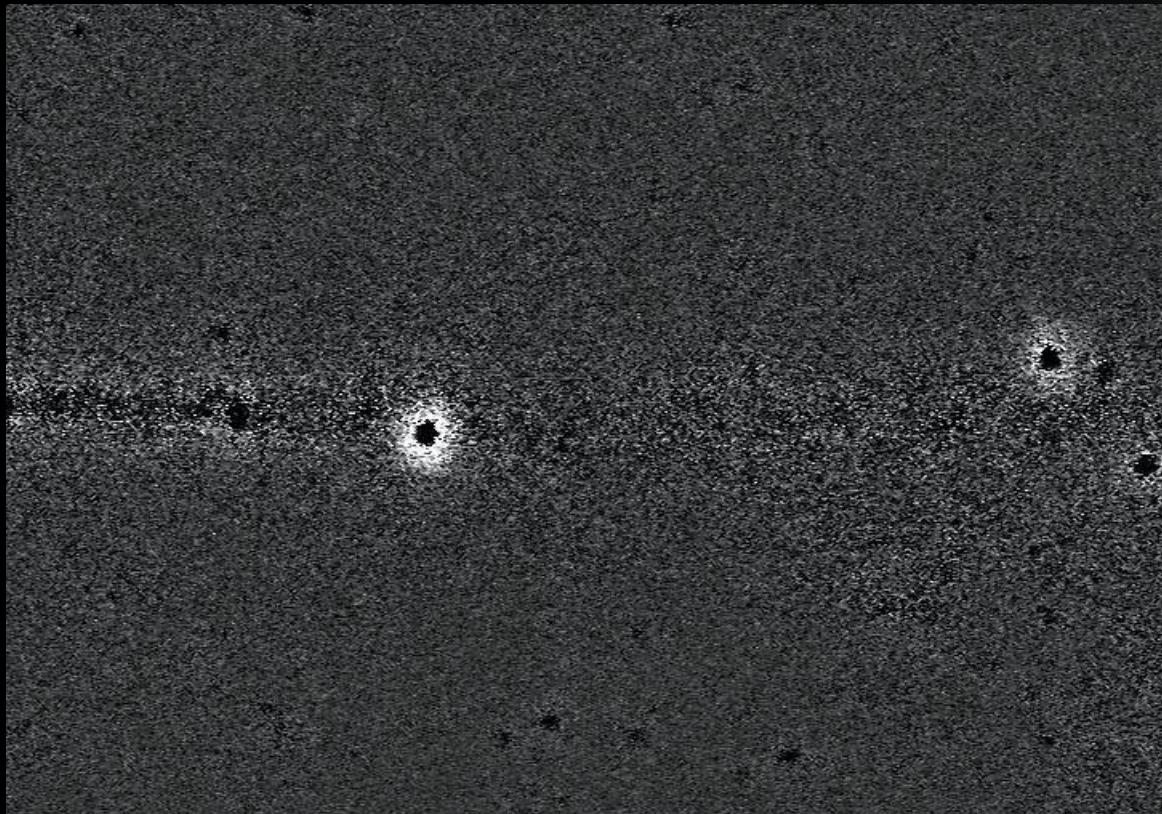
0.3-0.5 GeV, CLEAN, Allfront

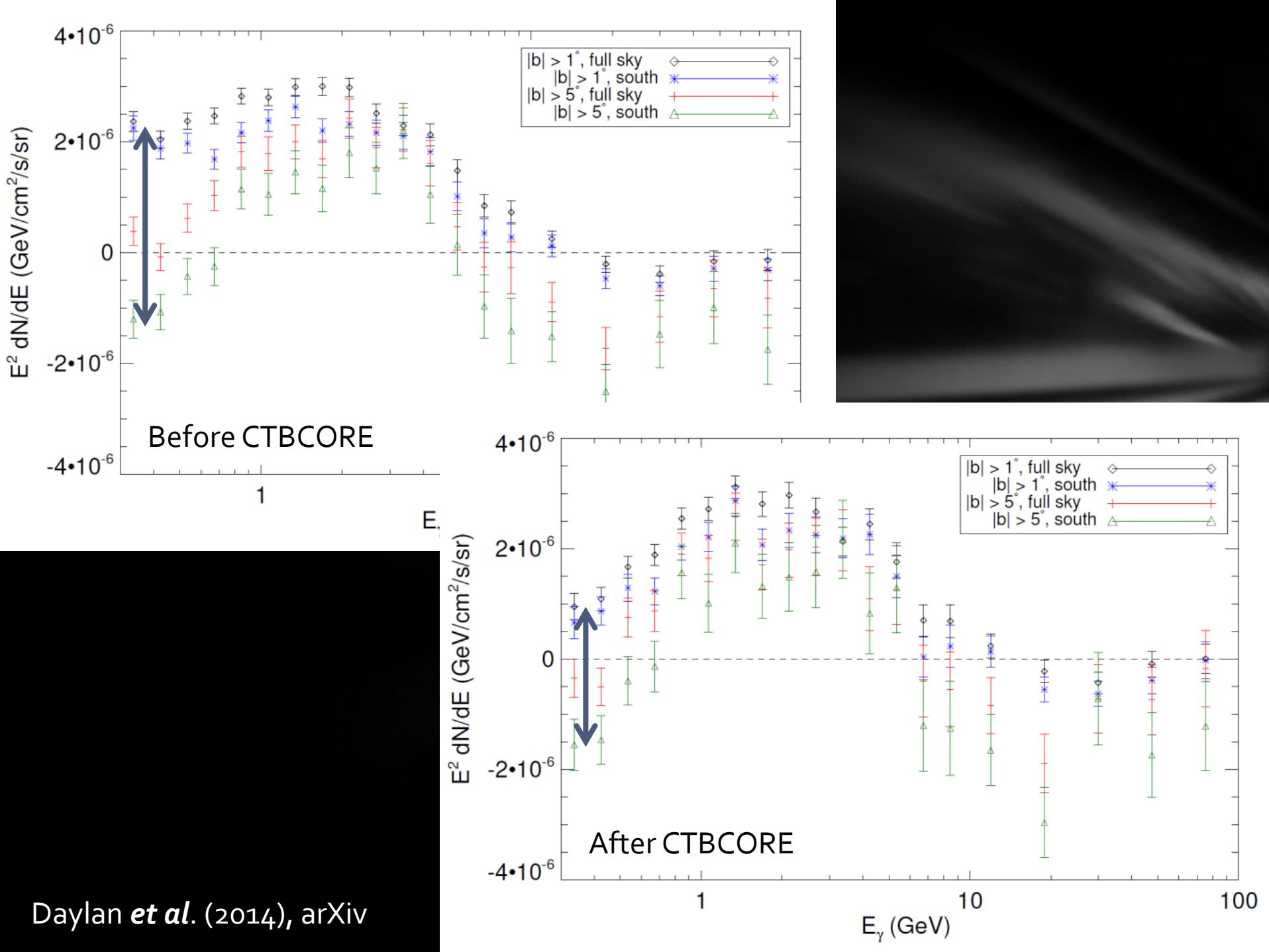


0.3-0.5 GeV, CLEAN, Q2

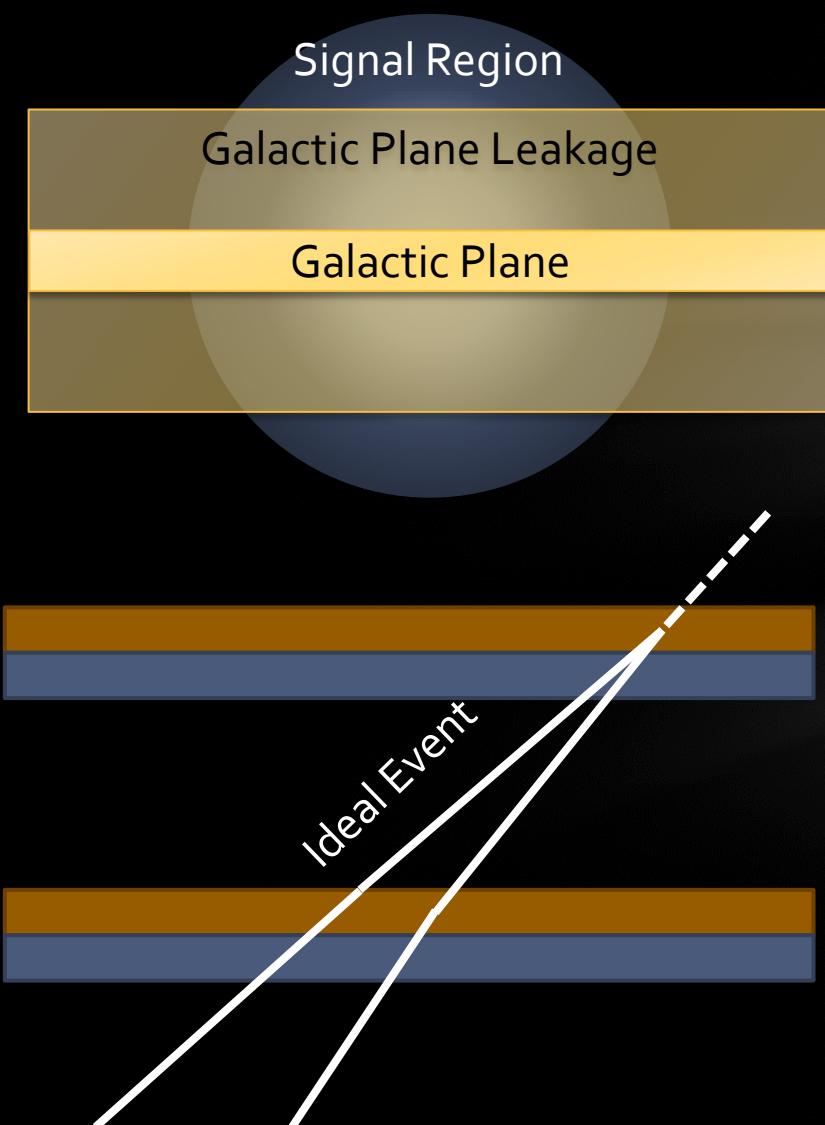


0.3-0.5 GeV, CLEAN, Allfront minus Q2

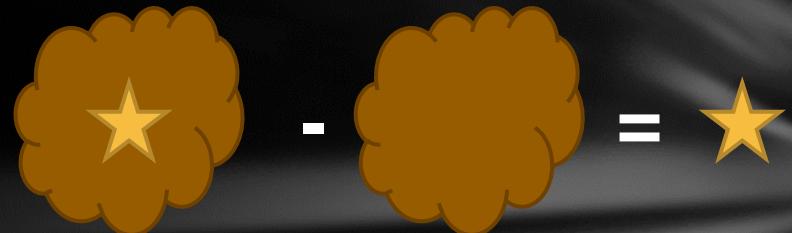




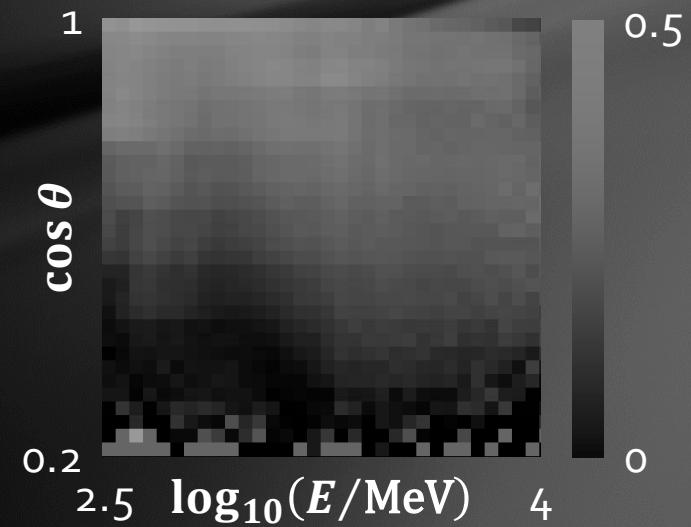
Conclusion



Point-Spread Function



Effective Area



Check out the maps + IRFs at
<http://fermi.skymaps.info/>