

VERITAS Progress Update

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Where we're going

- VERITAS Reconstruction pipeline
- VERITAS Data converters and progress
- VERITAS research projects using ctools

VERITAS Software Pipelines

γ Reconstruction

Astrophysical
Analysis

EventDisplay

C++/ROOT

VEGAS

C++/ROOT

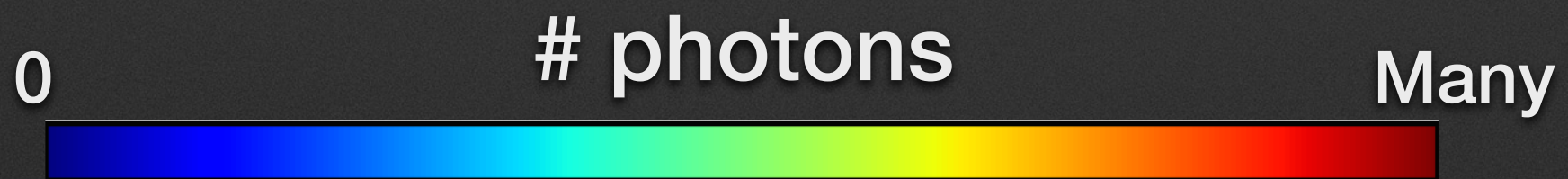
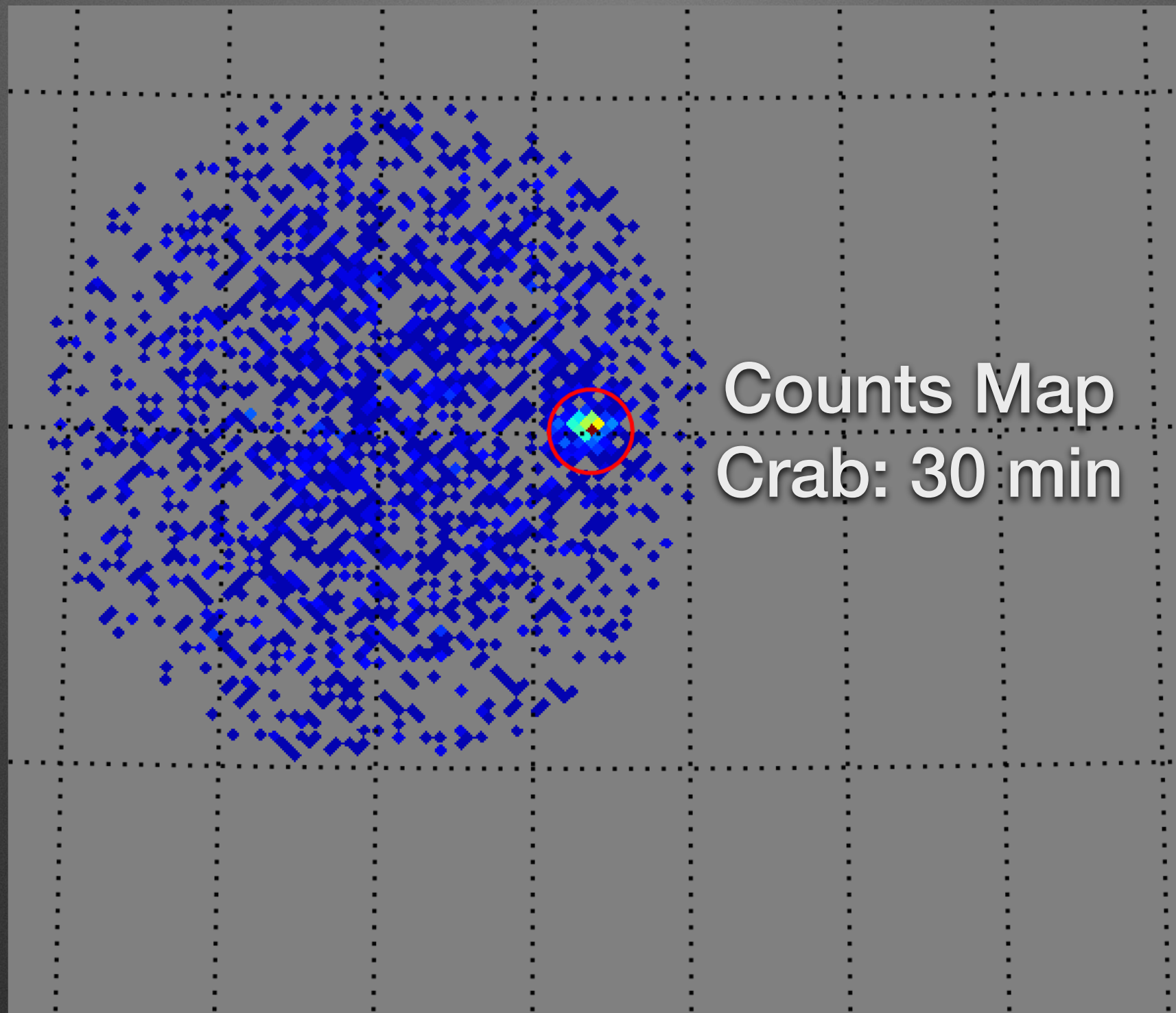
Data/Sims

CTOOLS!

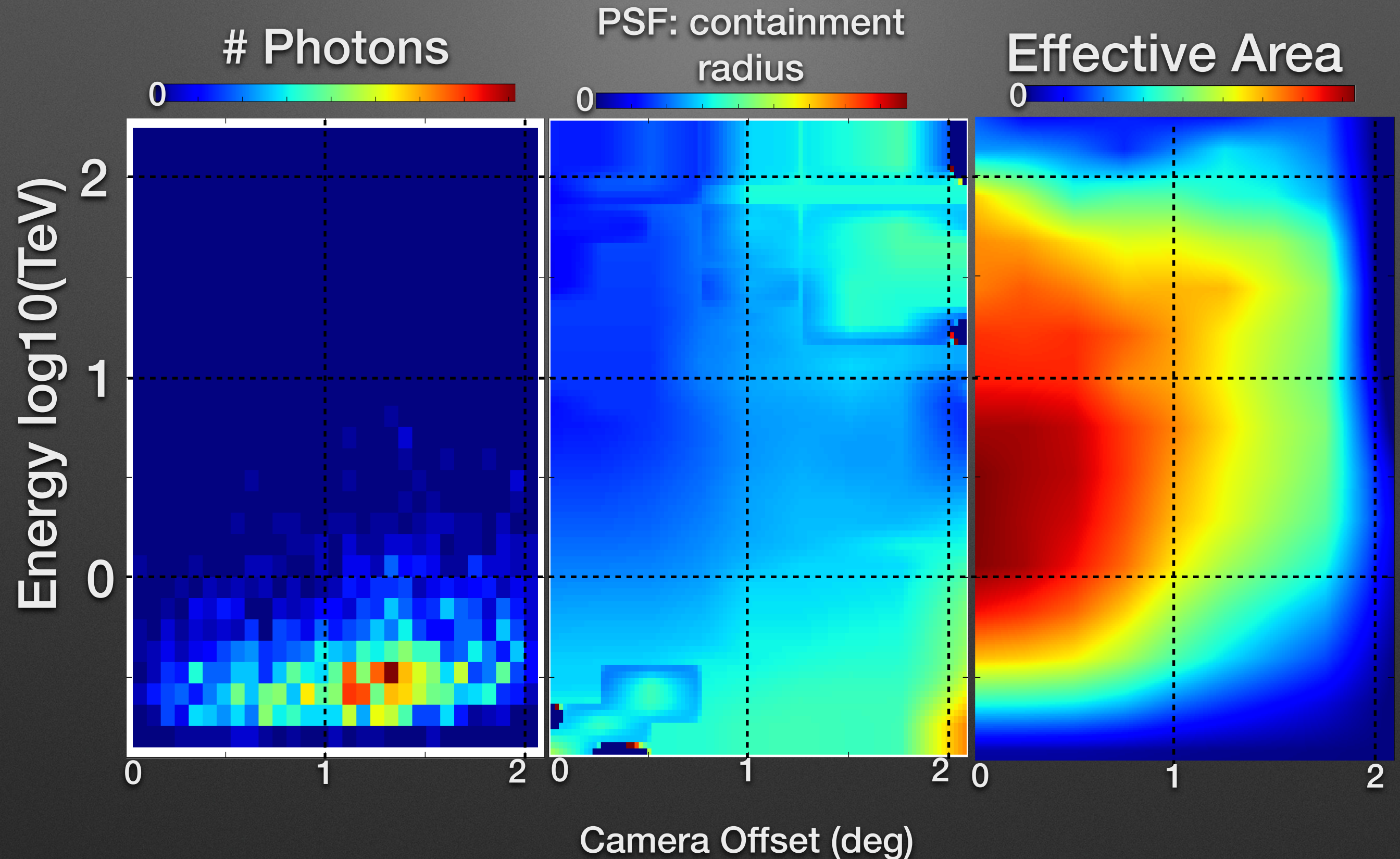
Status: EventDisplay FITS Converter

- Integrated into Event Display code
- One Veritas Run split into multiple fits files
 - one file ~ 5min observation
 - Converter packs IRFs into same file

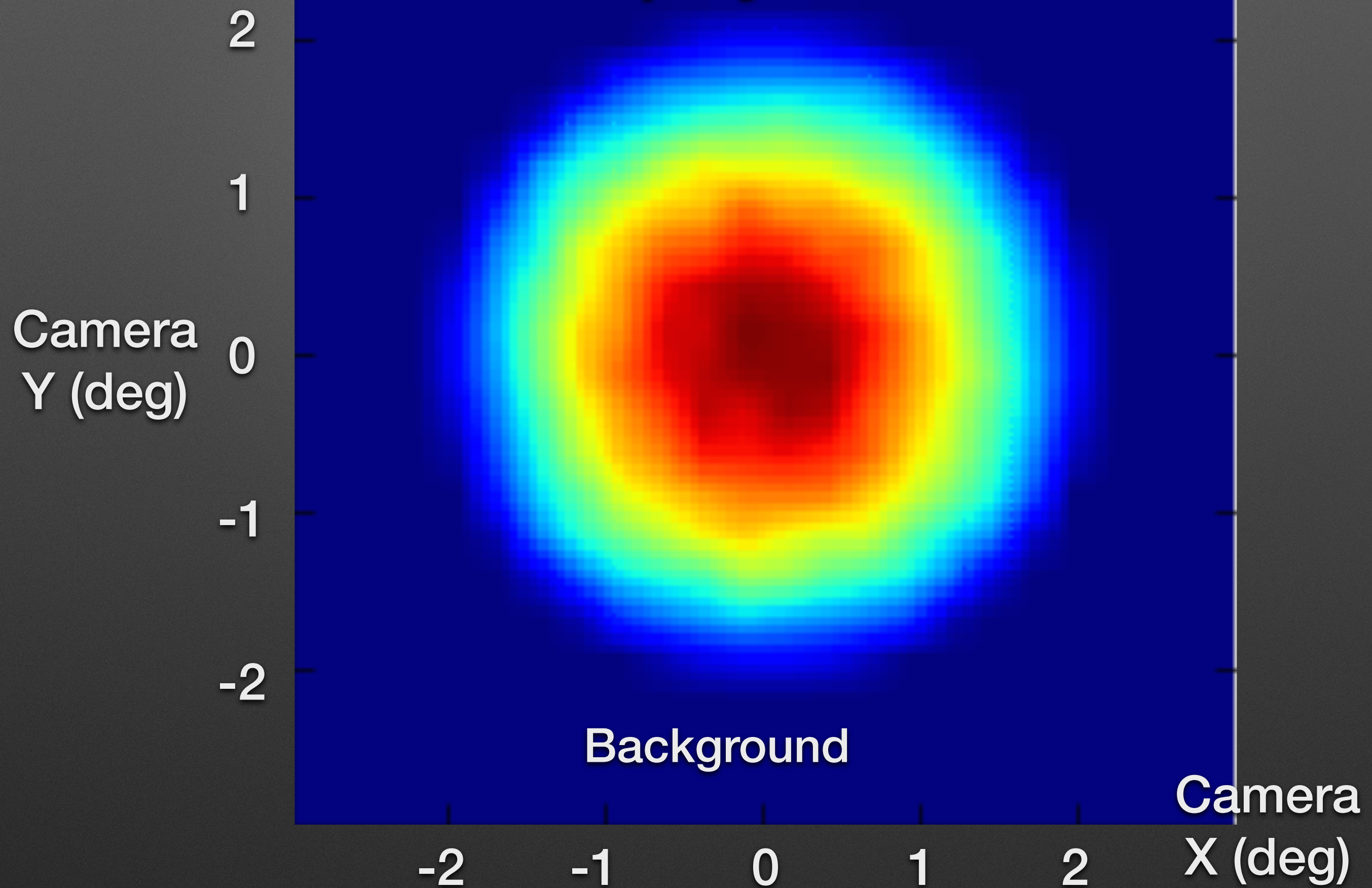
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- **Done:** Event list
- **Done:** Effective area, Psf (from simulations)
- **Almost Done:** Background (from data)
- **In Progress:** Source-by-Source Comparison between CTOOLS and EventDisplay

Veripy: Auxiliary Python Module

- Started with load-veritas-observations script
- Expanded to include:
 - Runlist / Sourcelist management
 - Database classes (for constructing runlists)
 - Diagnostic plotting with healpy/matplotlib
 - Doc webpage with examples
 - Cluster Job Management?
- **Not a layer between VERITAS and CTOOLS**
- Future: download pre-converted fits files on the fly?

VEGAS Converter

Hugh Dickinson

- Current progress:
 - IRFs successfully ported
 - Event Lists successfully mapped from ROOT to FITS file format.
 - VERITAS-specific VTOOLS applications (Branch of CTOOLS)
- Ongoing efforts:
 - Multi-observation VERITAS-only likelihood fitting.
 - Multi-instrument, independent and joint-likelihood fitting.

Galactic Center Dark Matter Halo

Nathan Kelley-Hoskins

- Analyse Sgr A* VERITAS data
- Account for complex backgrounds
- Model and likelihood test various DM Halos
- May add Radial GModel for Einasto and Navarro–Frenk–White profile?

Cygnus Region Progress

Maria Krause

- studying extended emission within the Cygnus region using VERITAS data
- calculate background using data and the likelihood method



The image shows a large, dark blue oval representing the Cygnus region. It is overlaid with a grid of dotted lines representing Galactic coordinates. A small, bright, multi-colored spot (red, orange, yellow, green, blue) is located in the lower-left quadrant of the oval, representing the Cygnus Region. The text 'Cygnus Region' is written in white below this spot. At the bottom of the oval, the text 'Exposure Map' is written in large white letters. To the right of the oval, the text 'Galactic Coordinates' is written in white. At the very bottom, there is a color bar legend with the text '0' on the left, 'Seconds' in the middle, and 'Many' on the right.

Cygnus
Region

Exposure Map

Galactic
Coordinates

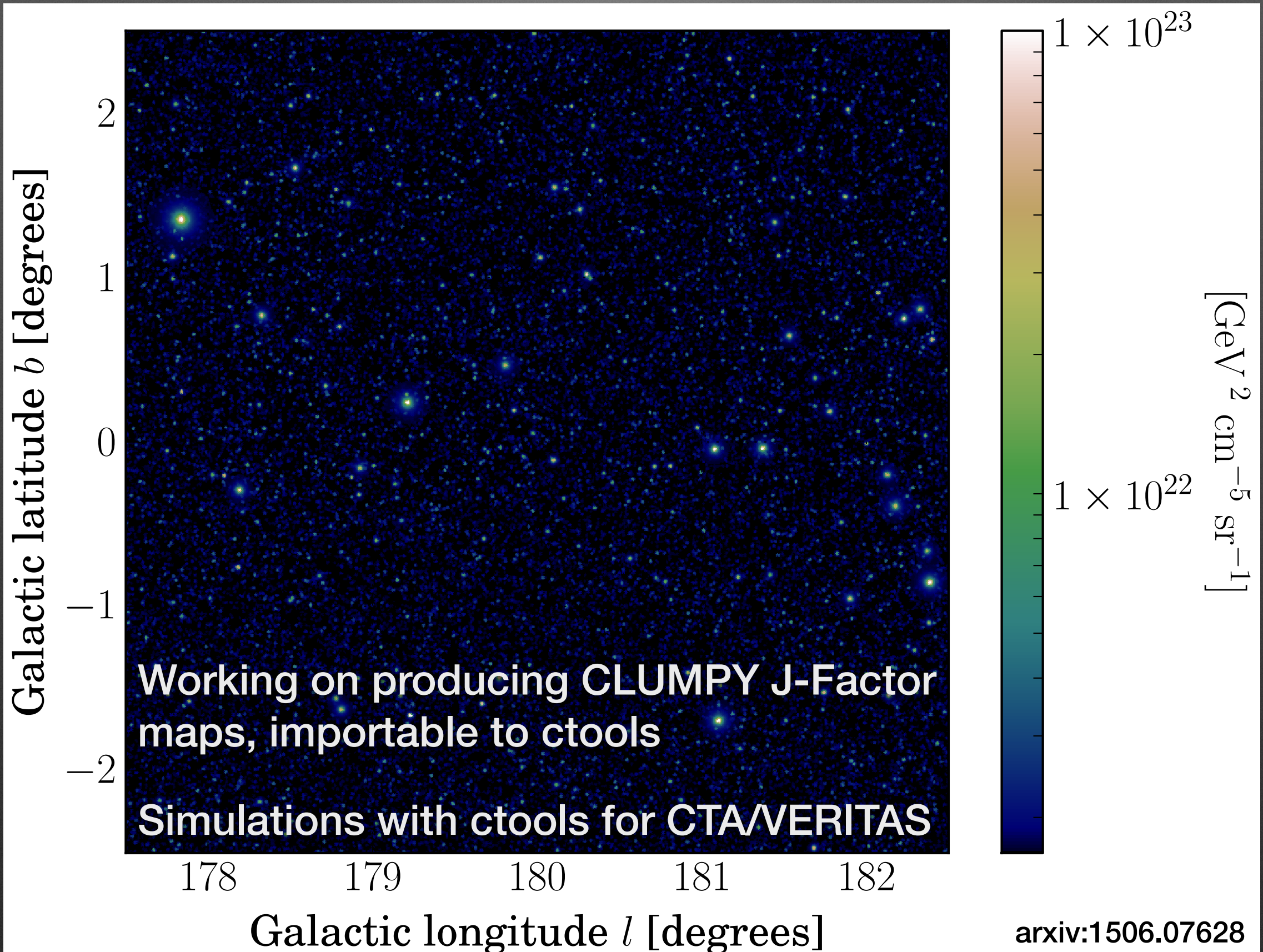
Seconds

0

Many

Galactic Dark Matter Clumps

Moritz Hütten



Whats Next

- Adaptively-binned background fits table
- Likelihood fit multiple VERITAS sources
 - Compare with EventDisplay Results
- Add Einasto/NFW Dark Matter Radial GModel?