

# **Dark Matter Searches for Extended Sources**

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HAWC Collaboration Meeting  
January, 2016

# Modeling Extended Sources

Main Progress:

## 1) Major LiFF overhaul

Many improvements internally stable fits, better handling of  $BG=0$  and deficits. Main change in the user interface: **Support very general source model definitions (spectra and morphologies)** through ModelInterface class designed for LiFF/3ML

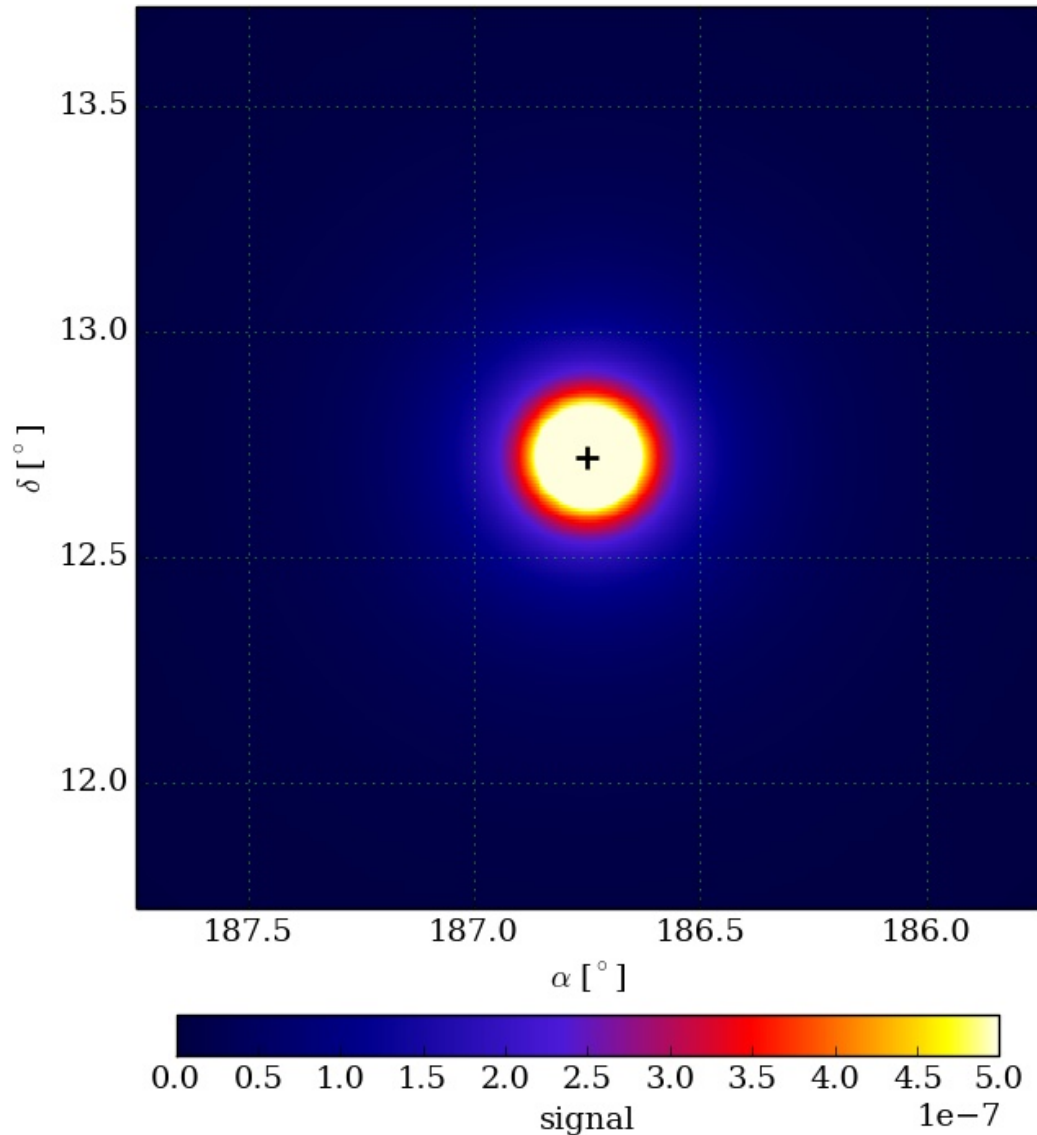
## 2) Morphology Modeling

- **PSF convolution with arbitrary morphologies** implemented in LiFF
- **LiFF-through-3ML testing** in progress, e.g. new functionality to use healpix maps to define source morphologies

## 3) Extended Source Templates

UNM has developed preliminary code to calculate and output expected fluxes per HEALPix pixels for dark matter morphologies (currently NFW profile).

# Sneak Peak: Healpix Map of Dark Matter Annihilation in Virgo



- Per-pixel (NSide 4096) expected signal with arbitrary scaling
- NFW profile, hence sharply peaked in the center (visible extent on the left largely dependent on color scale cut-off choice)
- For each analysis bin, multiply with expected gamma count for given spectrum (from LiFF)