

Galactic Halo ROI Selection

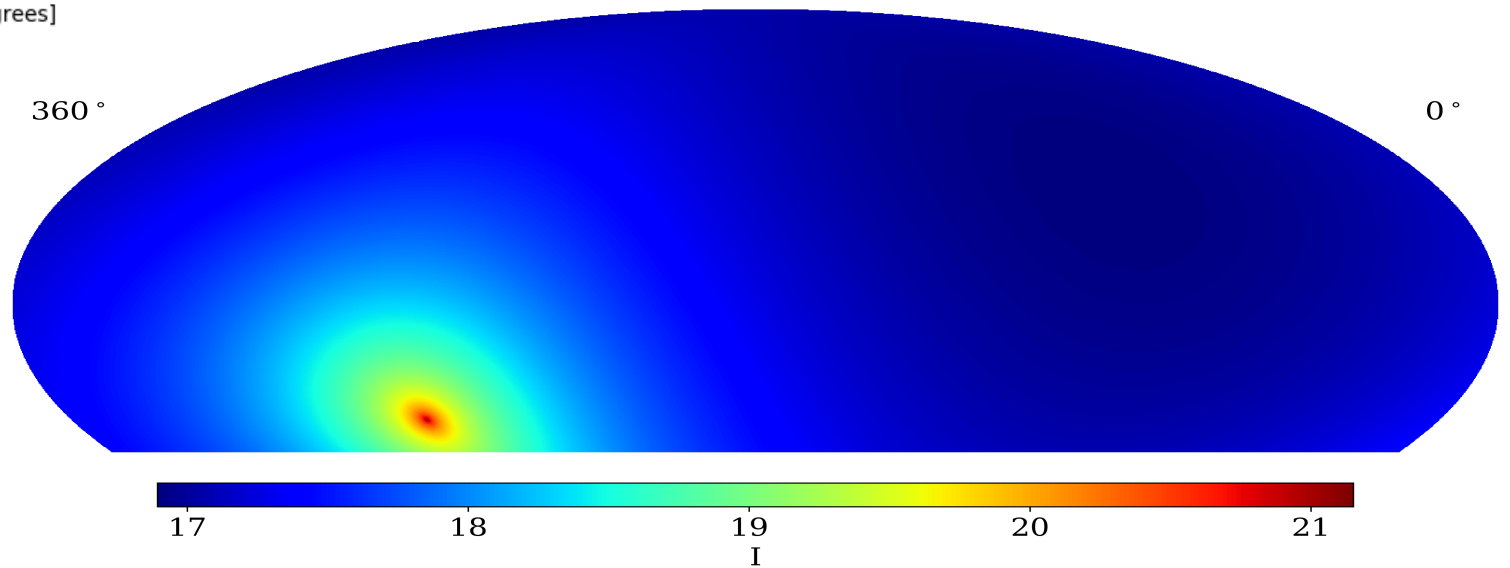
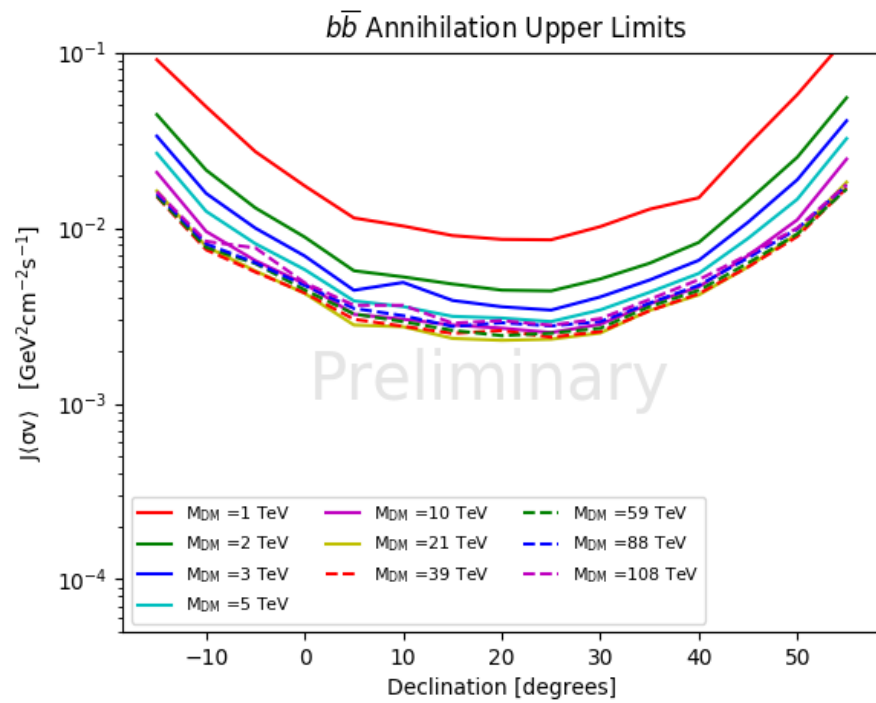
Reminder on Motivation

- Galactic halo: very close source of dark matter
- Highly extended
 - Any signal would be washed out by background selection
- Need to select region of interest (ROI) expected to yield highest signal
 - Mask out this region before estimating background

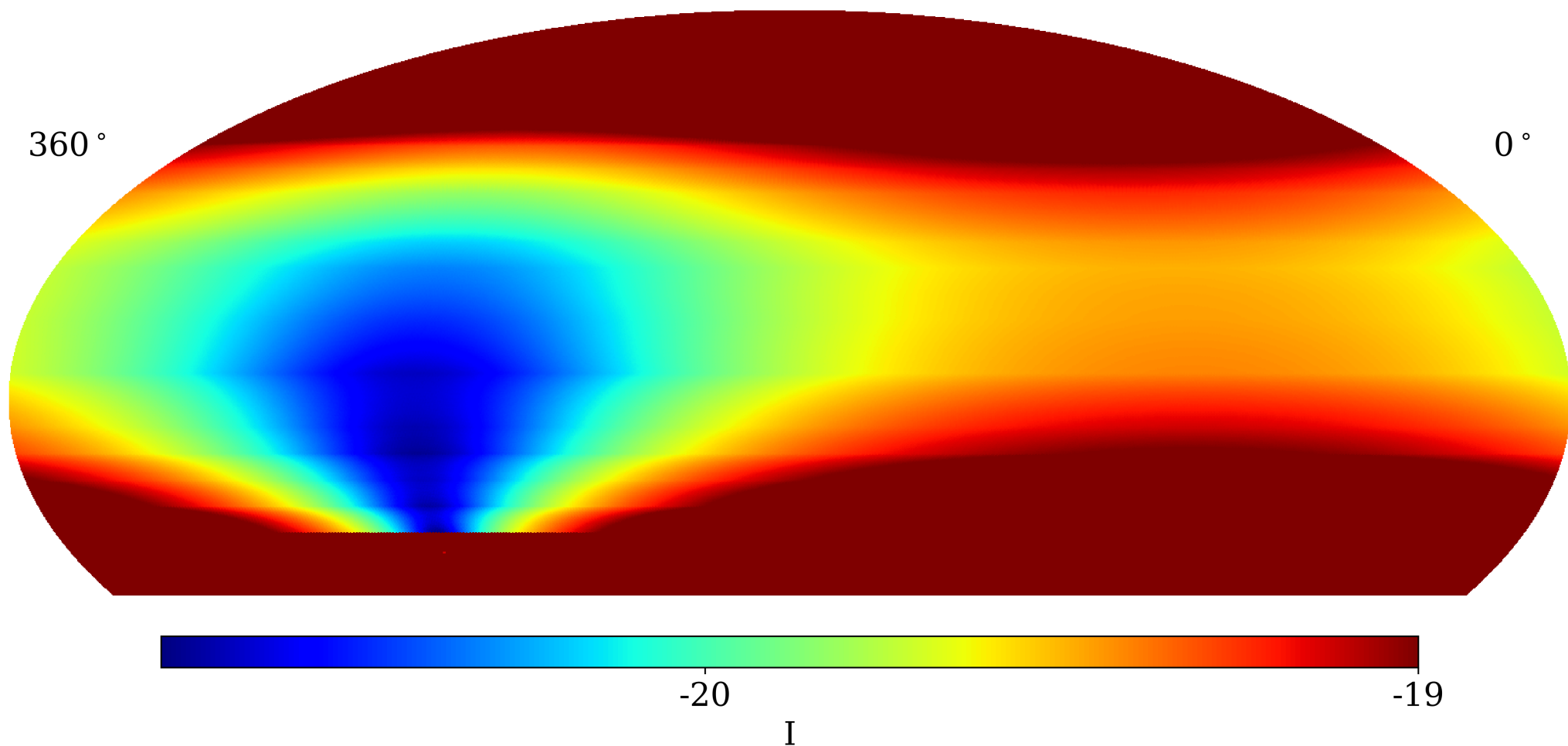
Technique

- Expected signal has two factors:
 - Dark matter density profile
 - HAWC's sensitivity
- Combine these two to estimate “best” ROI
 - Use dec-dependent flux limits from substructure search combined with simulated main halo
 - Scale cross-section*J limits by simulated J-factor
 - Select region with best sensitivity based on most constraining expected limit

Plots Used



Resulting Map for b b channel and



Moving Forward

- Clearly visible “rings” of expected limits in figure
- Can select ROI based on some sensitivity threshold
- Possible cross-check: use different spectra
- Map was made for Einasto profile
 - Re-make for Burkert and NFW
 - ROI may change in those cases