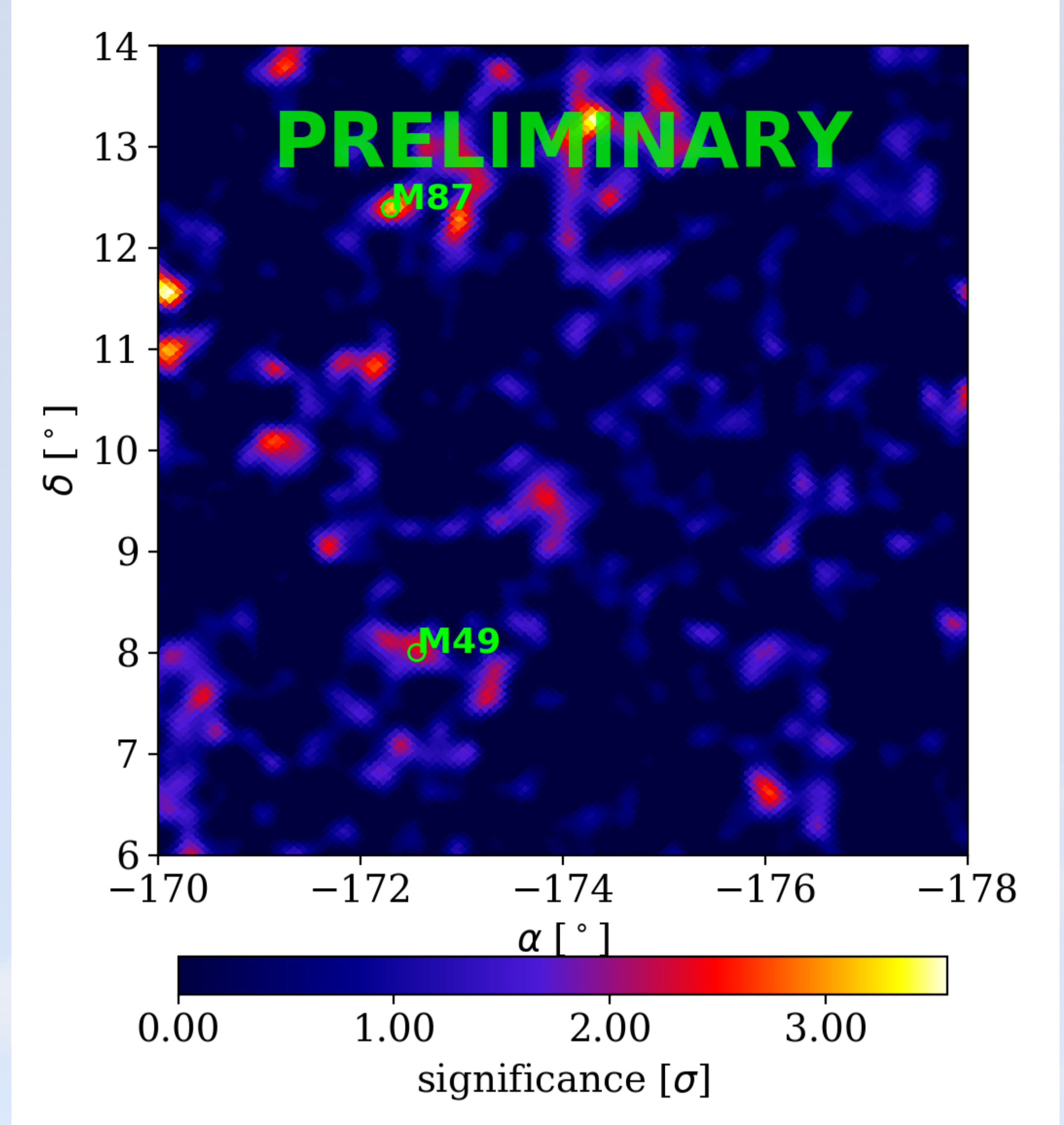
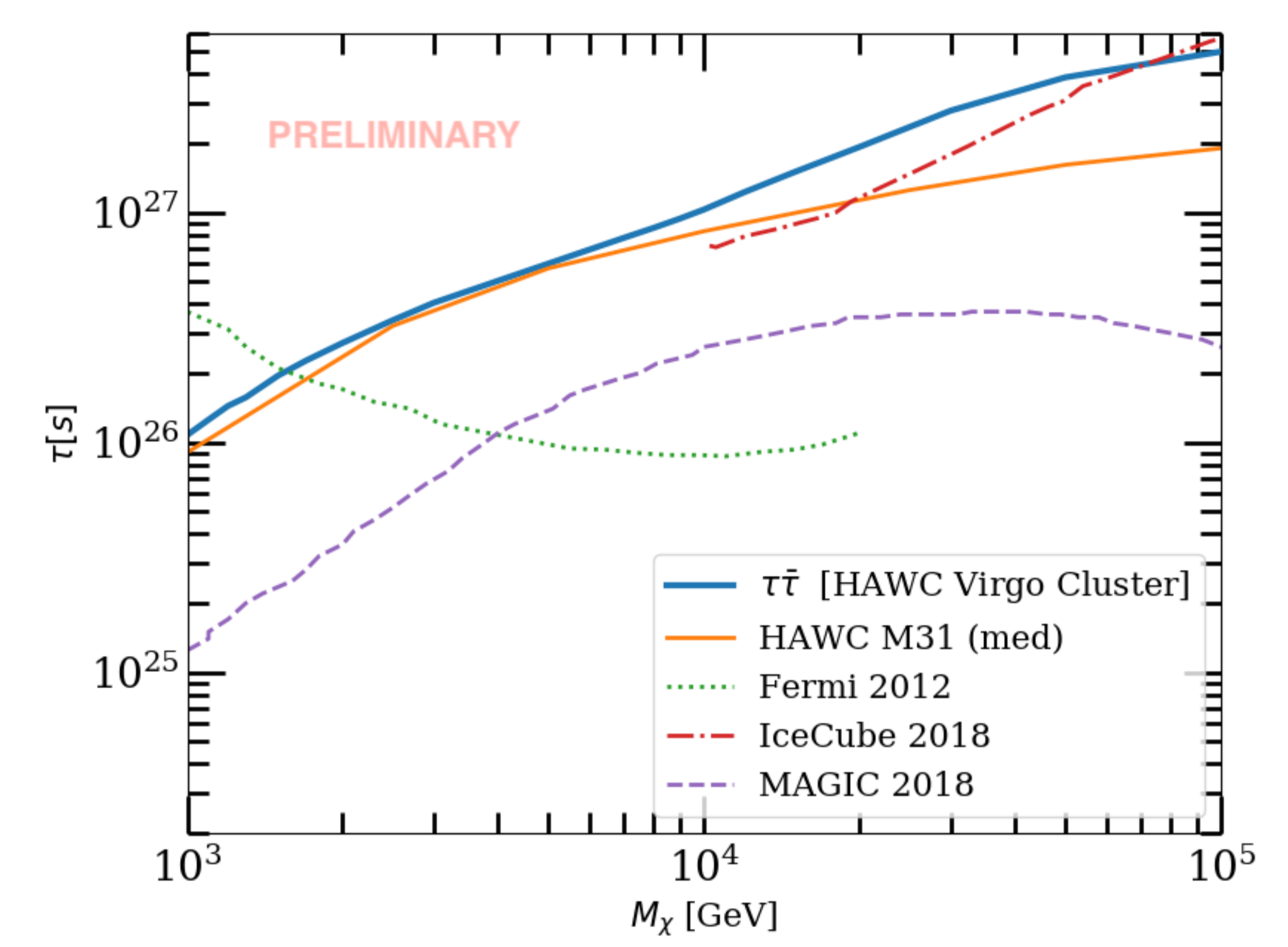
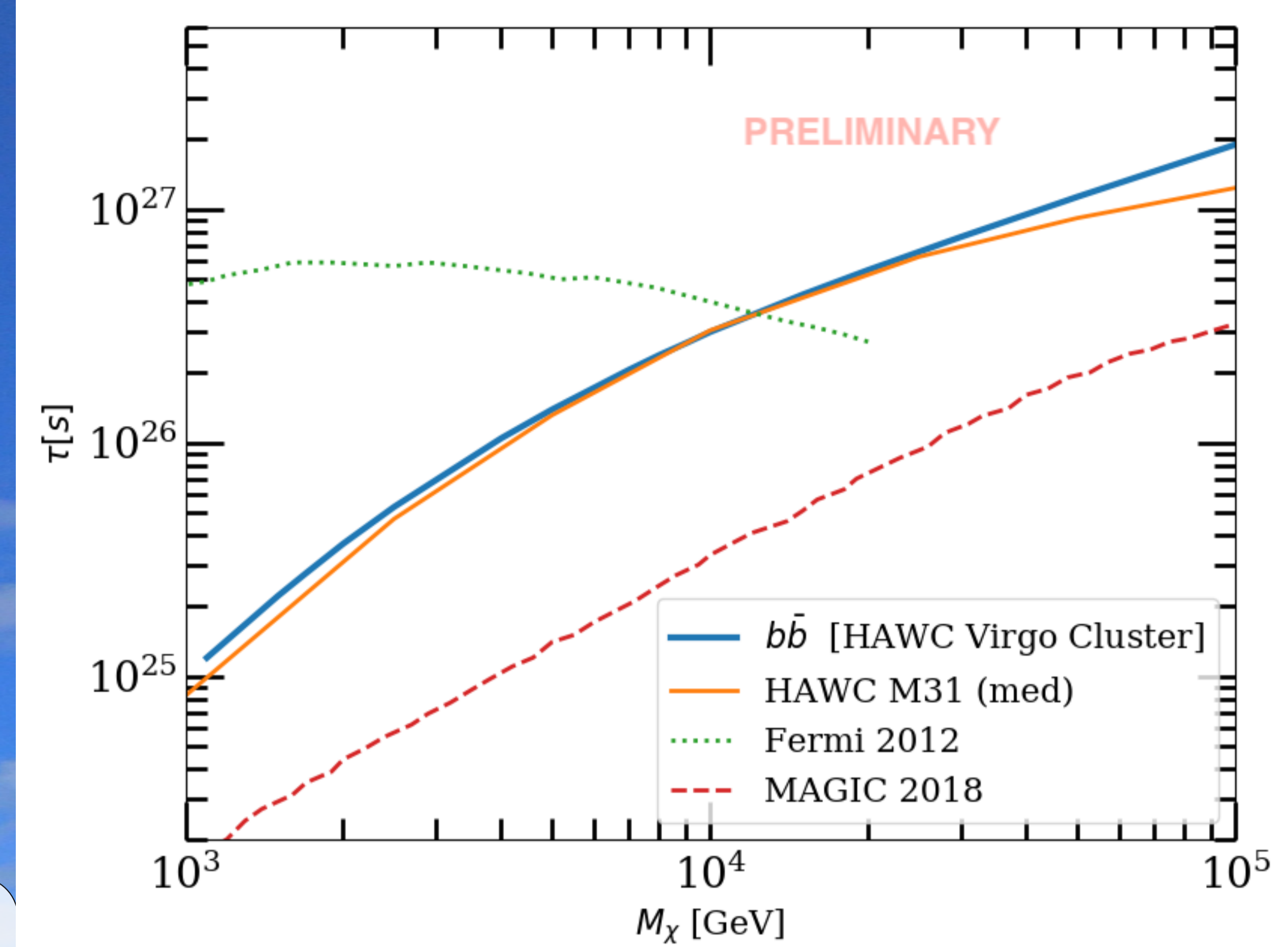


The Virgo Cluster

- 1523 days of gamma-ray data
- Cluster of galaxies spanning more than $> 5^\circ$ radius in the sky in HAWC's FOV.
- Extended region suitable for DM decay searches.
- Sub-clusters centered at M87 and M49



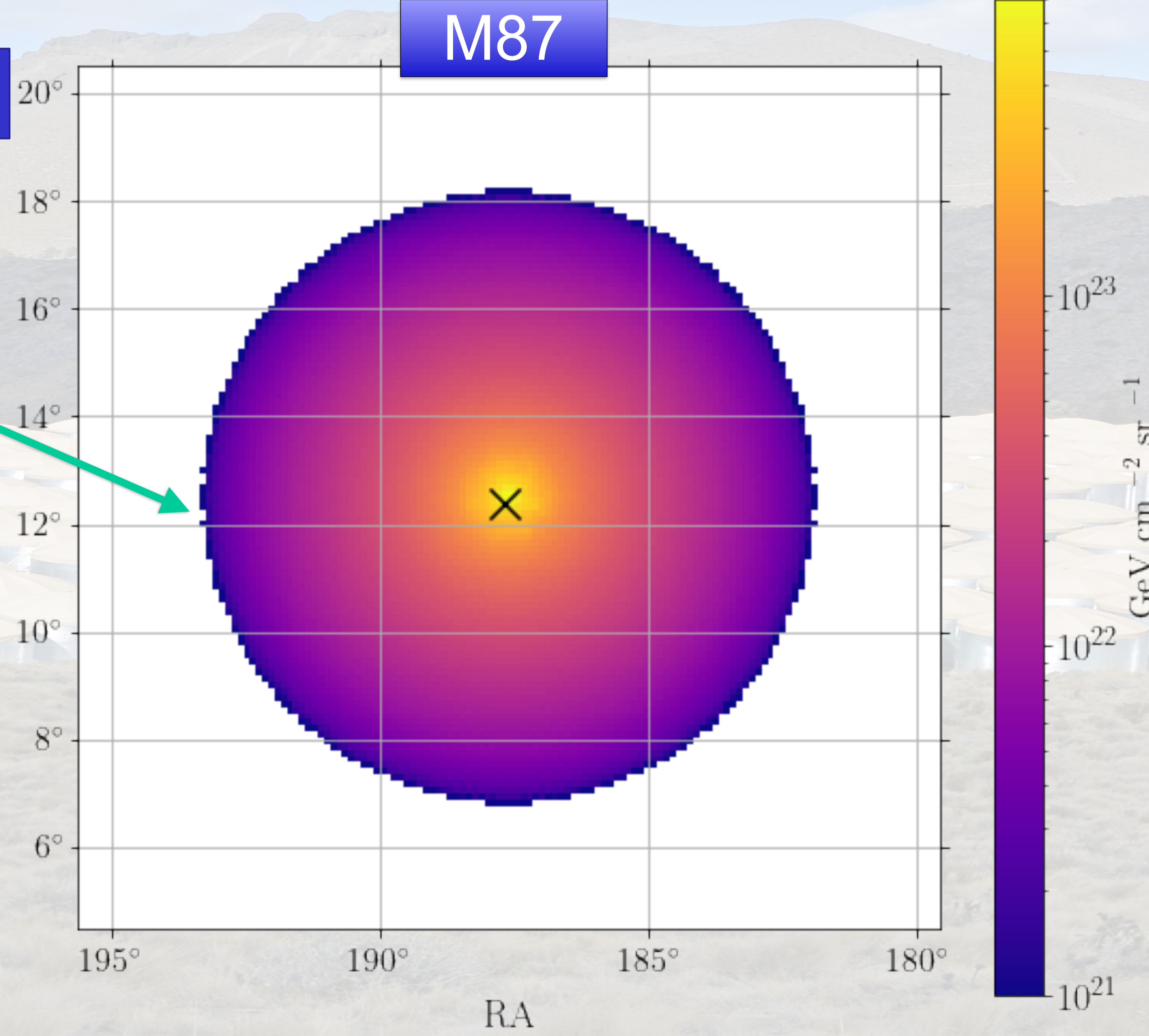
Lower Limits on Decay Lifetime



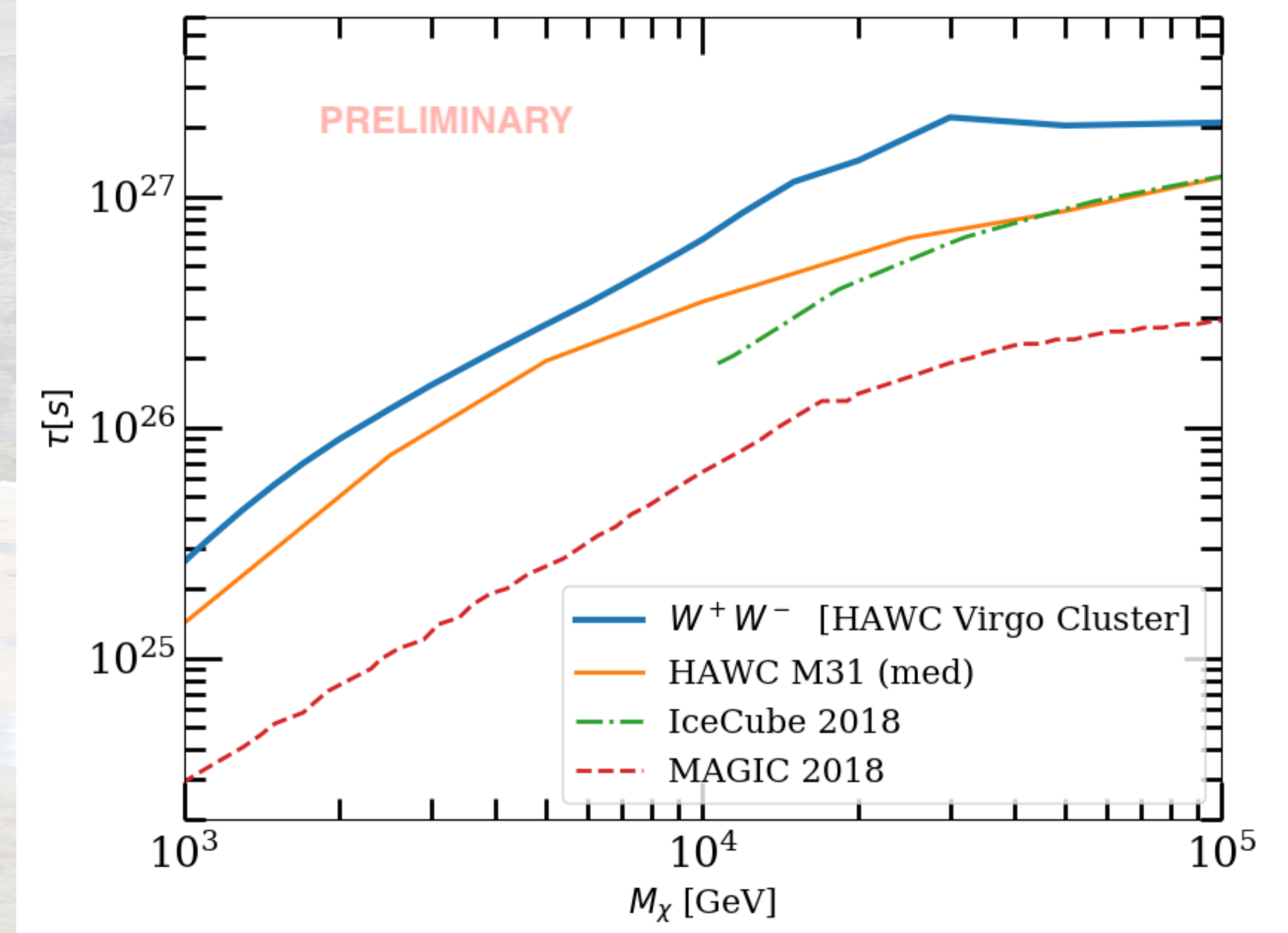
Spatial Templates

$$\frac{d\phi}{dE} = \frac{1}{4\pi\tau M_\chi} \frac{dN}{dE} D$$

Expected Flux $\leftarrow \frac{d\phi}{dE}$
 Decay lifetime $\leftarrow \tau$
 DM Mass $\leftarrow M_\chi$
 D (Spatial Template)



- Reporting initial constraints on decay lifetime for DM decay to $b\bar{b}$, $\tau\bar{\tau}$ and W^+W^-
- Strongest constraints for DM masses above 20 TeV.
- Future work will include additional channels and sensitivity with more data.



References

1. See proceedings Nisa 2021, 37th ICRC and the references within.