The TeV Diffuse Gamma-Ray Emission: Time Variability and Prospects for Future Detection

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Diffuse Emission at TeV Energies

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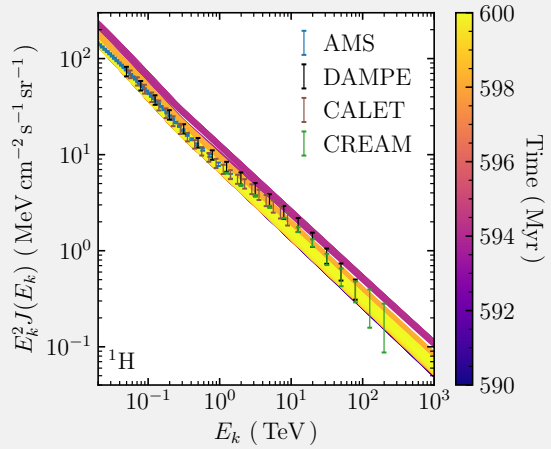
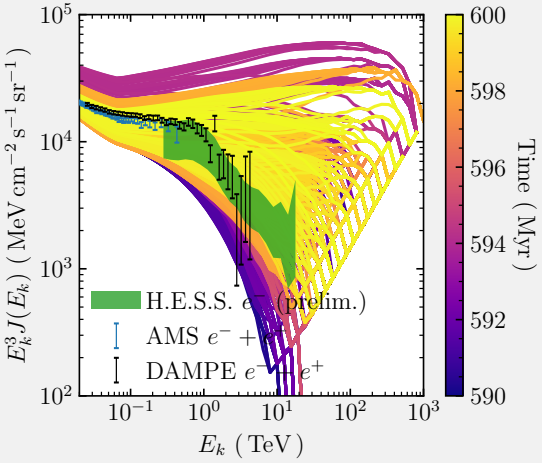
- The diffuse γ–ray emission has been observed at GeV energies by *Fermi*–LAT (Ackermann et al. 2012), TeV energies H.E.S.S. (Abdalla et al. 2018), and PeV energies with Tibet AS$_\gamma$ (Amenomori et al. 2021)
- Galaxy-wide, time-independent CR transport simulations can be used to model the GeV diffuse γ–ray emission
- For our modelling we use GALPROP, which has been shown to accurately model the GeV diffuse γ–ray emission (e.g. Abdo et al. 2010; Ackermann et al. 2015; Acero et al. 2016a)
- Our previous work (Marinos et al.2023) found that for TeV energies and above we need to use a time-dependent solution to accurately capture leptonic emissions.

Time-Dependent CR Spectra





LEFT: Proton Spectrum

RIGHT: Total Electron and Positron Spectrum

Comparison to Observations