Dark Matter indirect detection: the positron channel

UniverseNet meeting

Timur Delahaye

Primary positrons

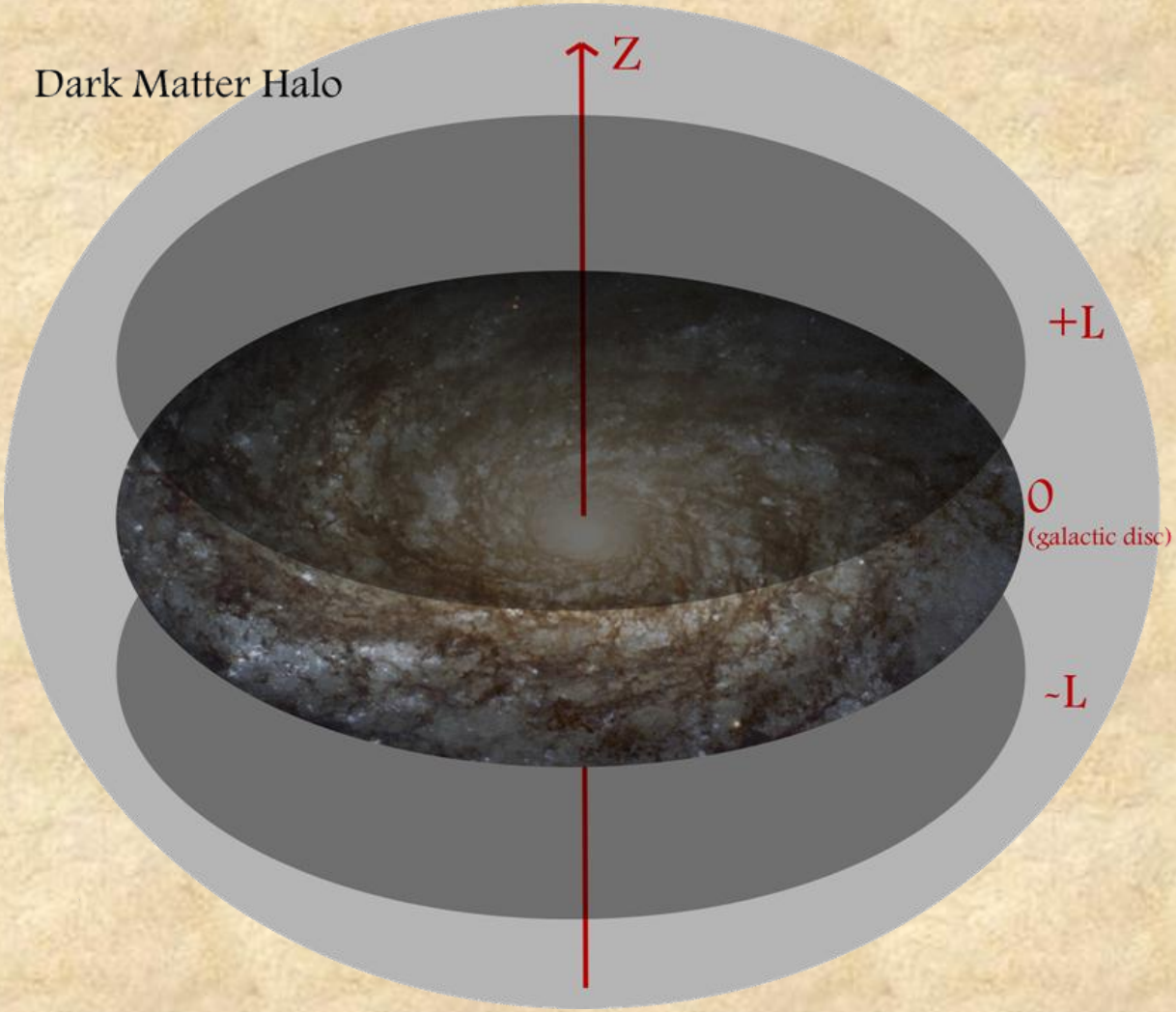
Positrons from dark matter annihilation in the galactic halo: theoretical uncertainties

With R. Lineros, F. Donato, N. Fornengo & P. Salati

Physical Review D 77 (2008) 063527

arXiv:astro-ph/0712.2312

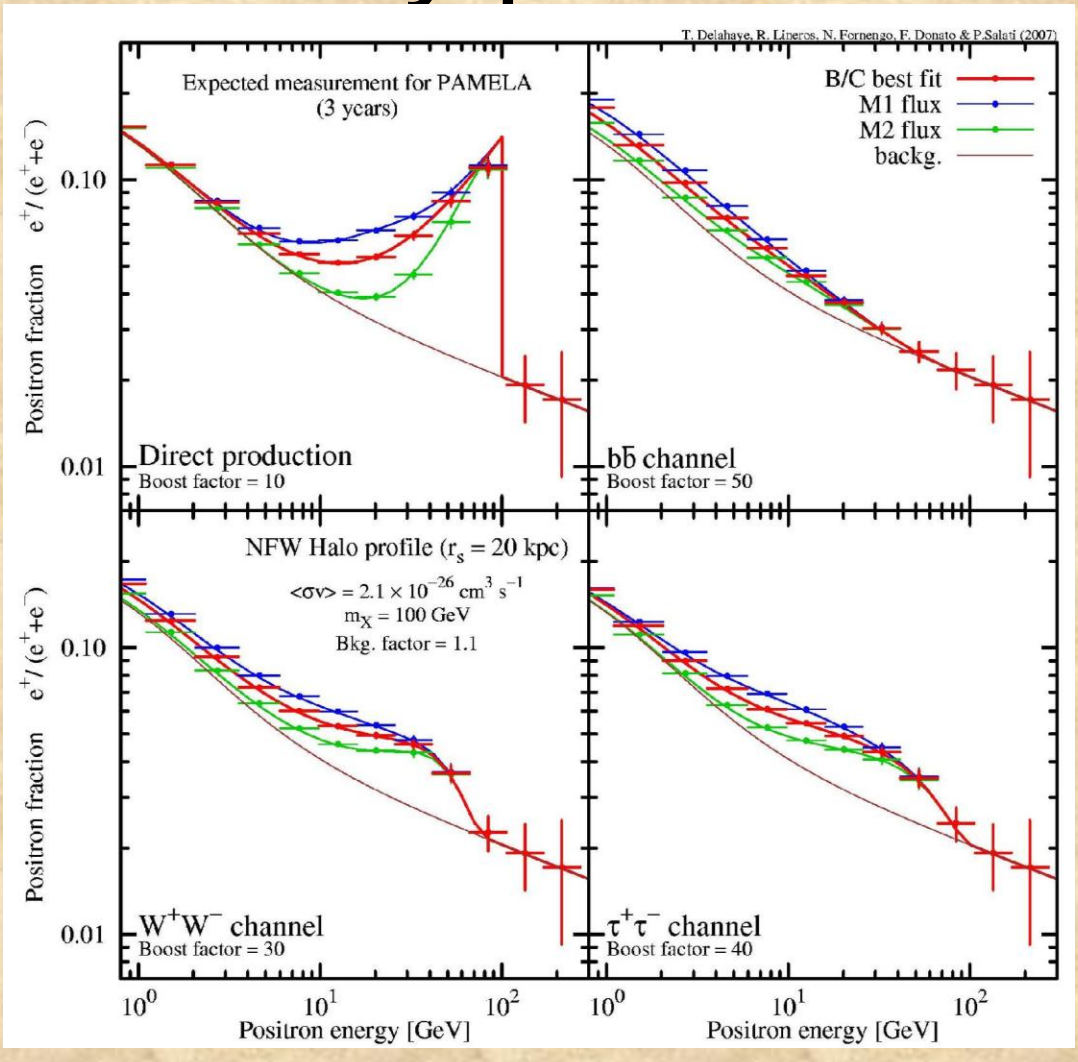
The model



The model

$$-\vec{\nabla}\cdot\left(K\,\vec{\nabla}n+\vec{V}_c\,n\right)-\frac{1}{\tau_e}\frac{\partial E^2 n}{\partial E}-\frac{\partial}{\partial E}\left(K_{EE}\frac{\partial n}{\partial E}\right)$$
$$=q\left(\vec{r},t,E\right)-2h\Gamma\,\delta(z)n$$

Primary positrons

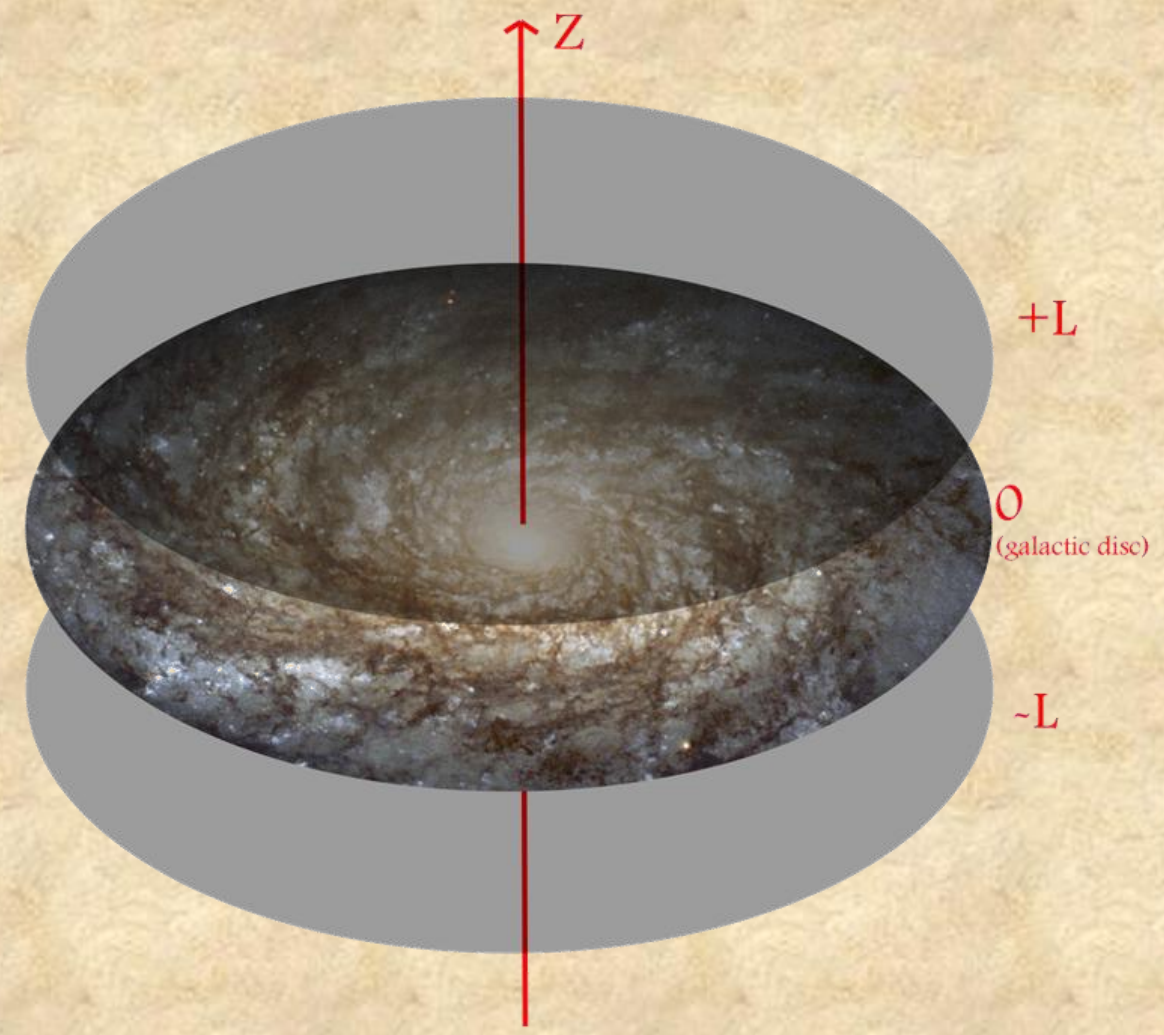


Secondary positrons

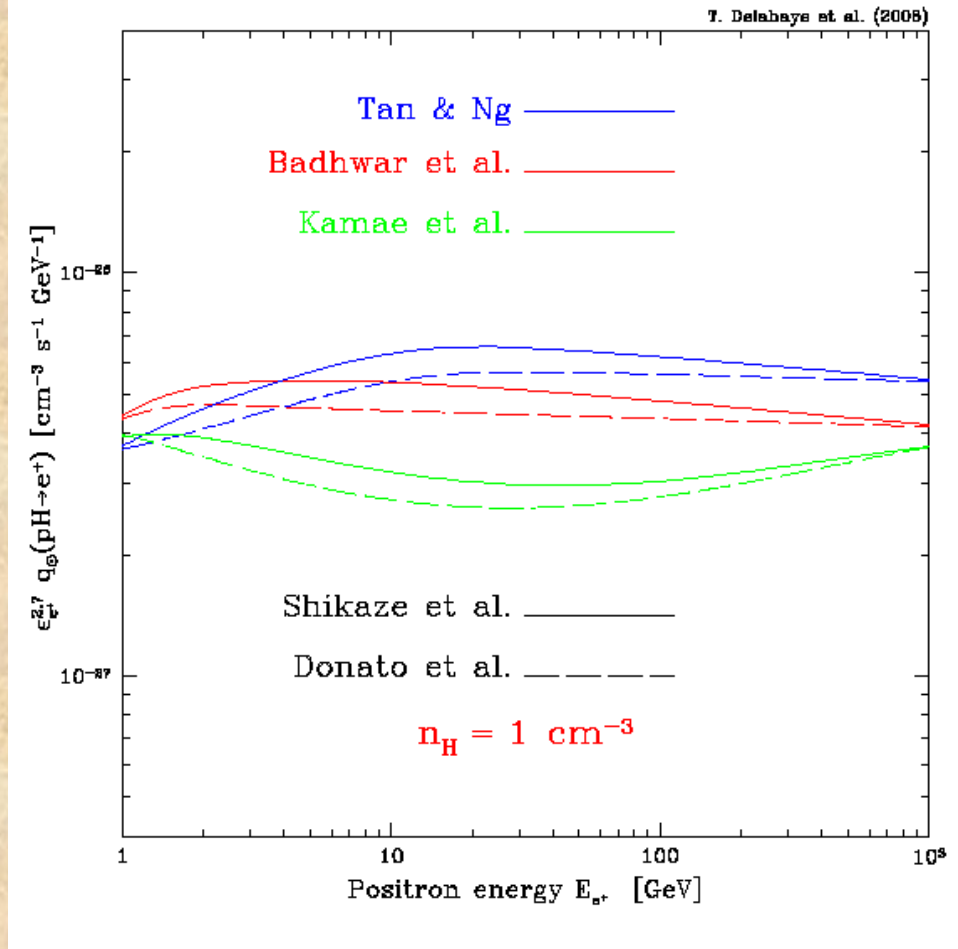
arXiv : 0809.5268

with R. Lineros, J. Lavalle, P. Salati, F. Donato, N. Fornengo & R. Taillet

The model

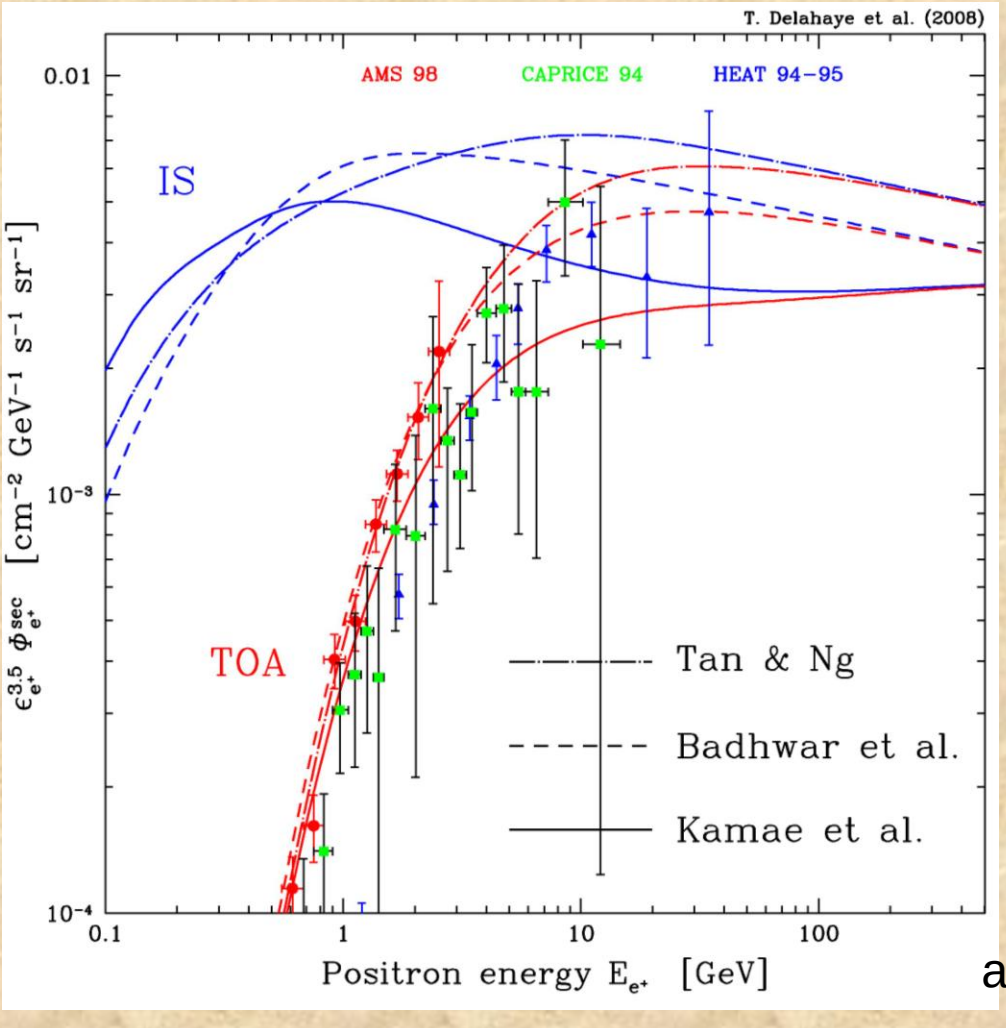


Positron source



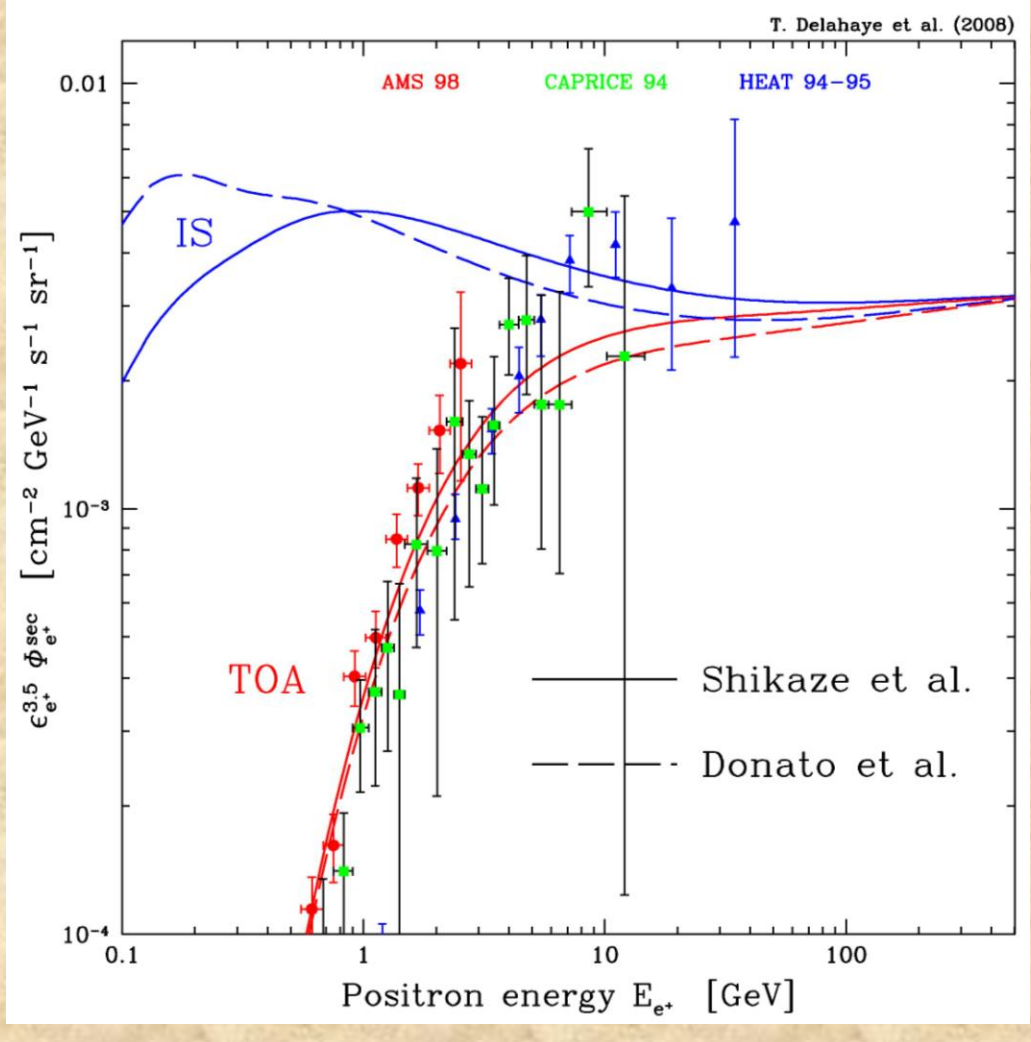
arXiv : 0809.5268

Cross sections



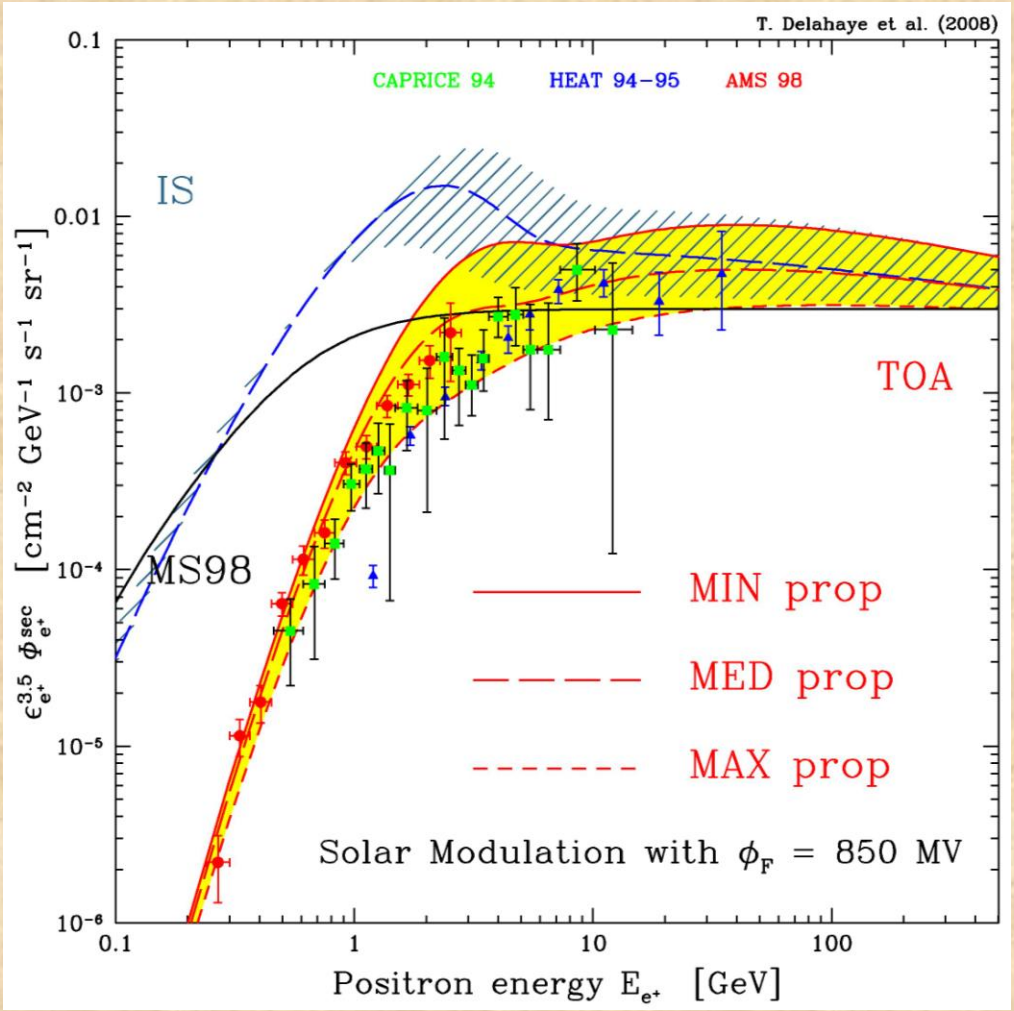
arXiv : 0809.5268

Proton flux



arXiv : 0809.5268

Secondary positrons



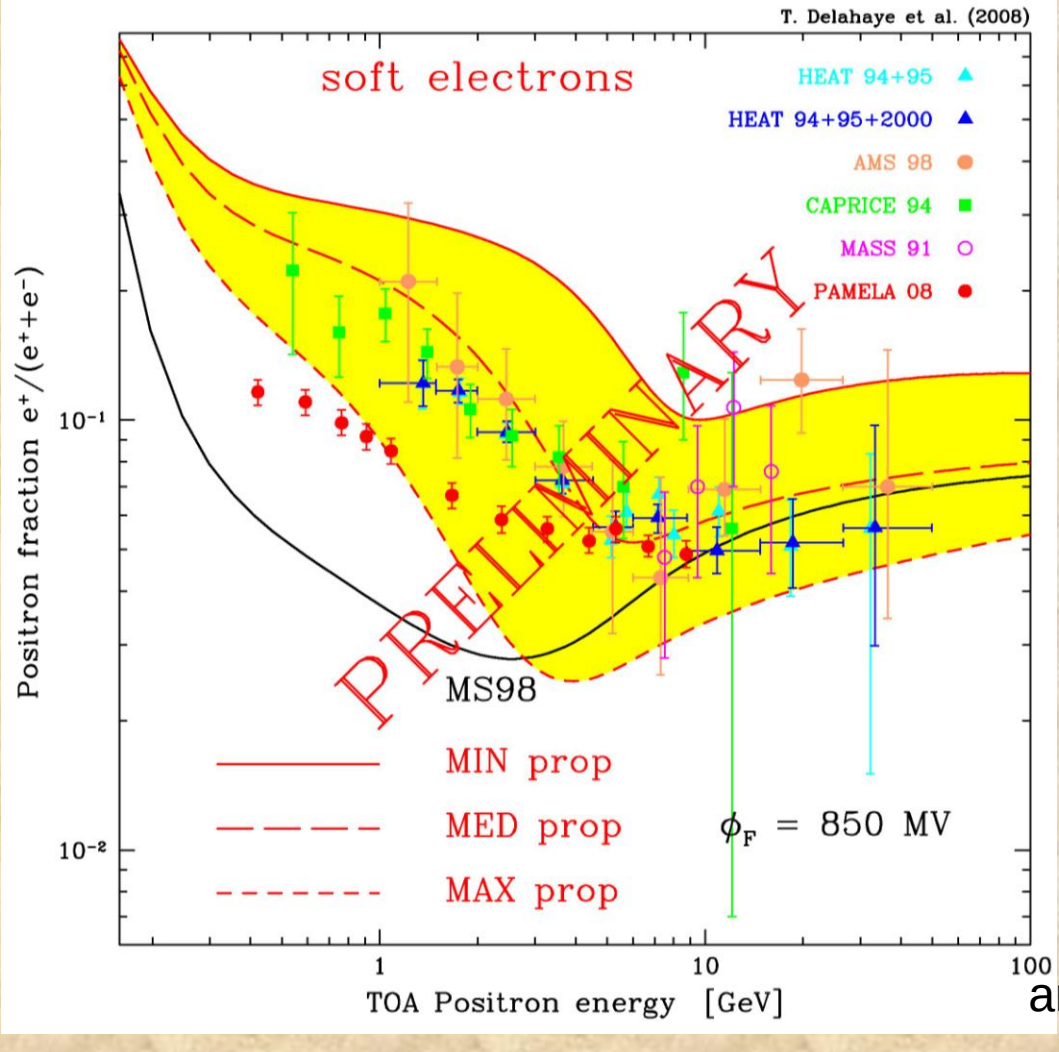
Badhwar et al.

arXiv : 0809.5268

What is next ?

- Analysing PAMELA data :
  - Is there an exotic signal ?
  - Can we put constraints on new physics ?
- Multi-channel analysis (pbar, γ …)

Is there an excess ?



arXiv : 0809.5268

Do you have questions

PAMELA Data