

US Status

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Flux calculation

- $F \sim \sigma J$

Before we get sensitivities and limits on the flux we would like feedback on the calculations...

The bottom line is:

to average or not to average !!

– $\sigma \equiv$ cross section of neutralino annihilations

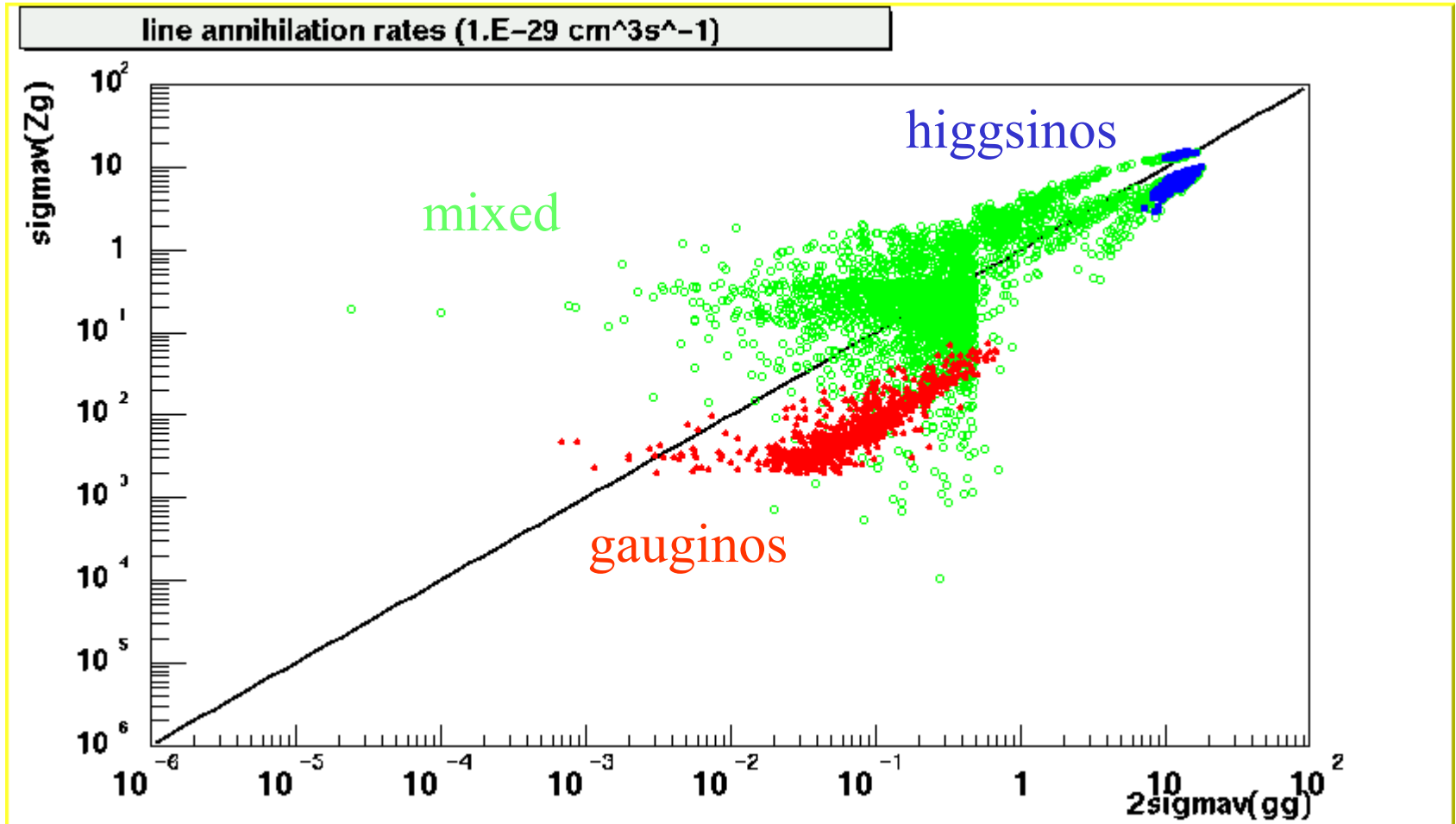
– $J(\hat{n}) = \frac{1}{R\rho_{\chi}^2} \int \rho^2(l) dl(\hat{n})$
line-of-sight

In all calculations we used NFW and assumed no clumpiness of the halo

We compared our results with Bergstrom et al Astr. Phys 9 (1998), 137 – Fig. 3.
As expected the highest values of the rates are obtained for higgsino-like neutralinos, while gaugino-like neutralinos have the lowest cross section .

$$0.05 \leq \Omega_\chi h^2 \leq 0.5$$

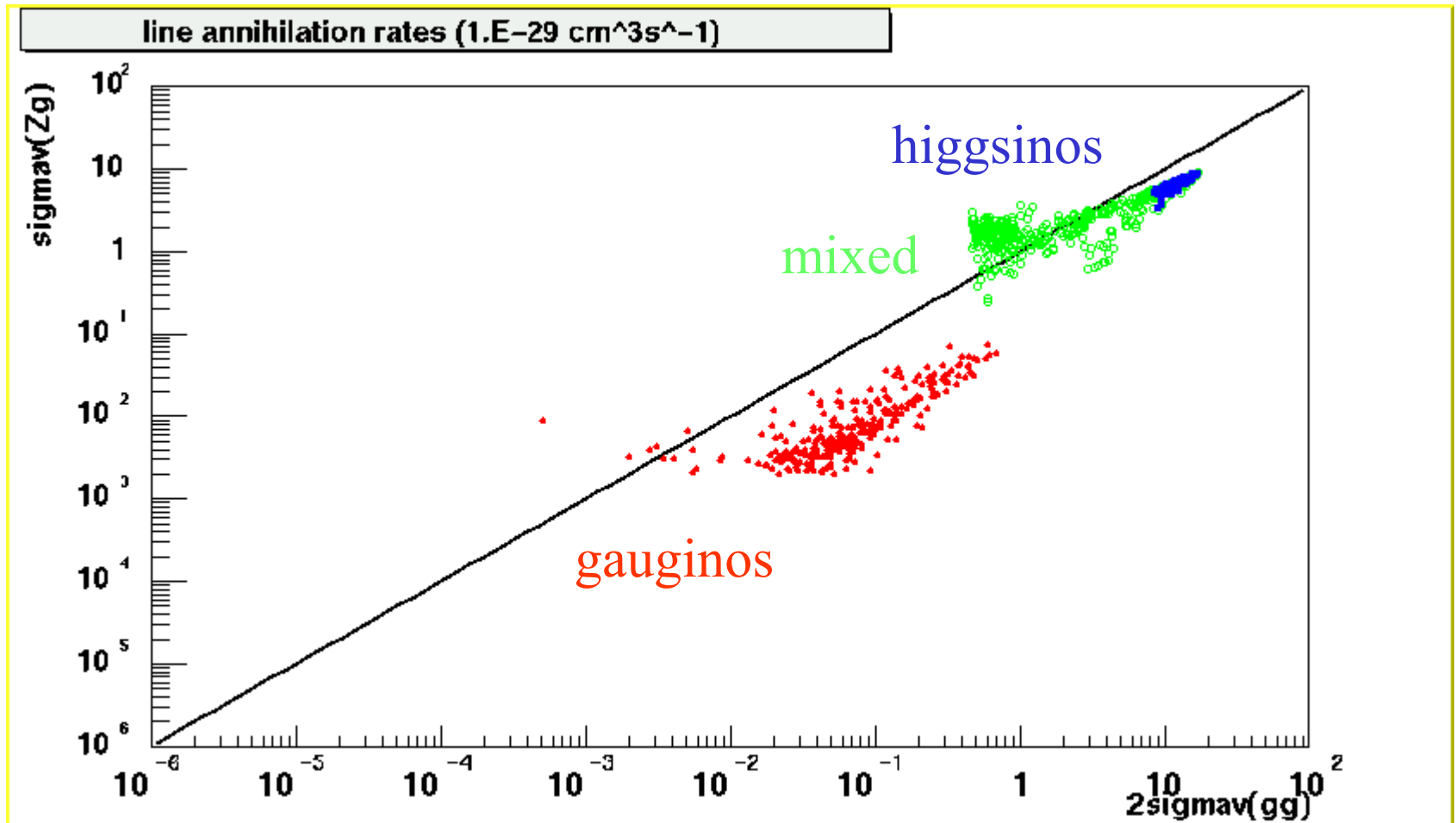
$$M_\chi = 50 - 500 \text{ GeV}$$



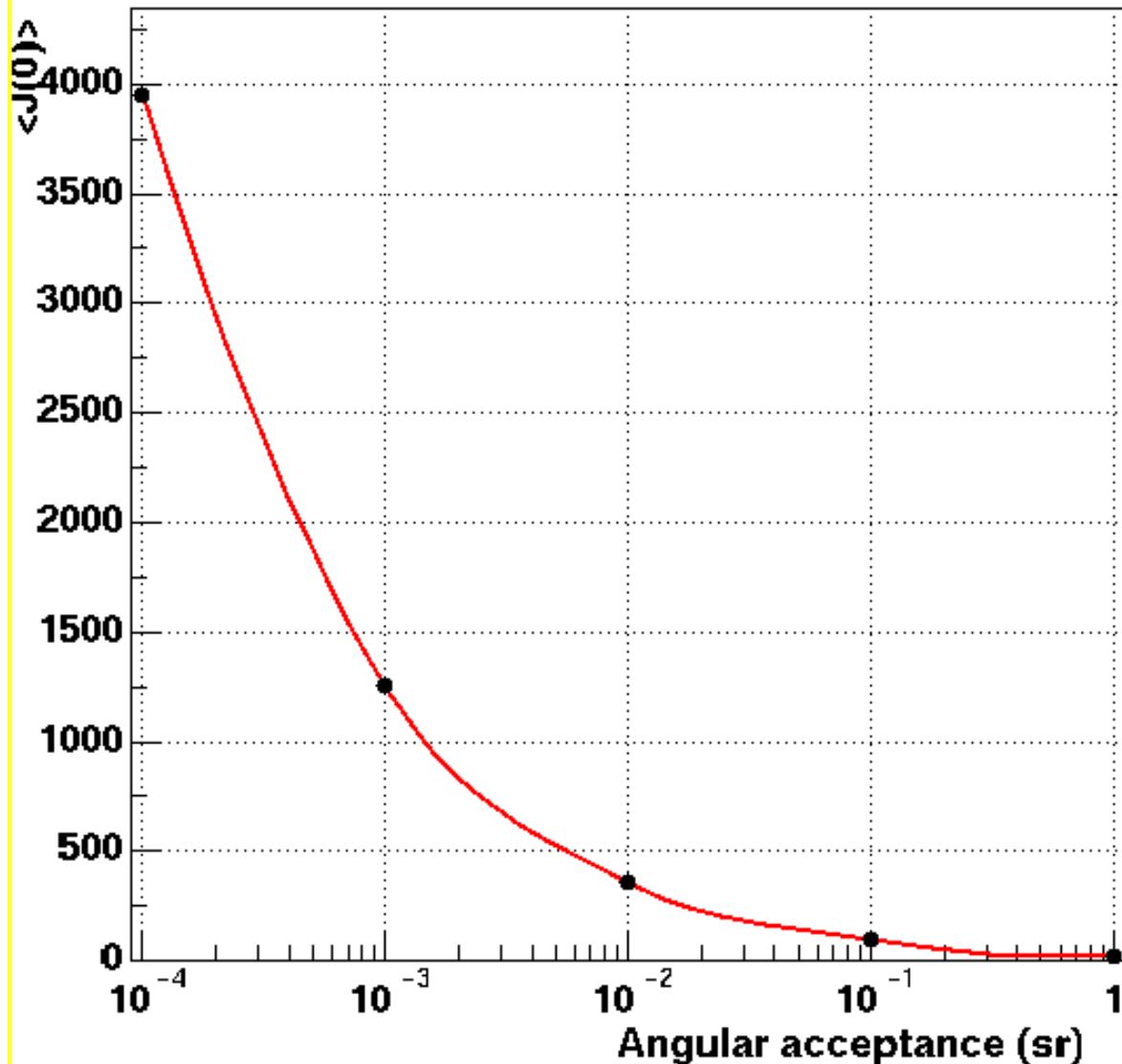
We now restrict the region for the relic density

$$0.1 \leq \Omega_\chi h^2 \leq 0.3$$

$$M_\chi = 50 - 500 \text{ GeV}$$



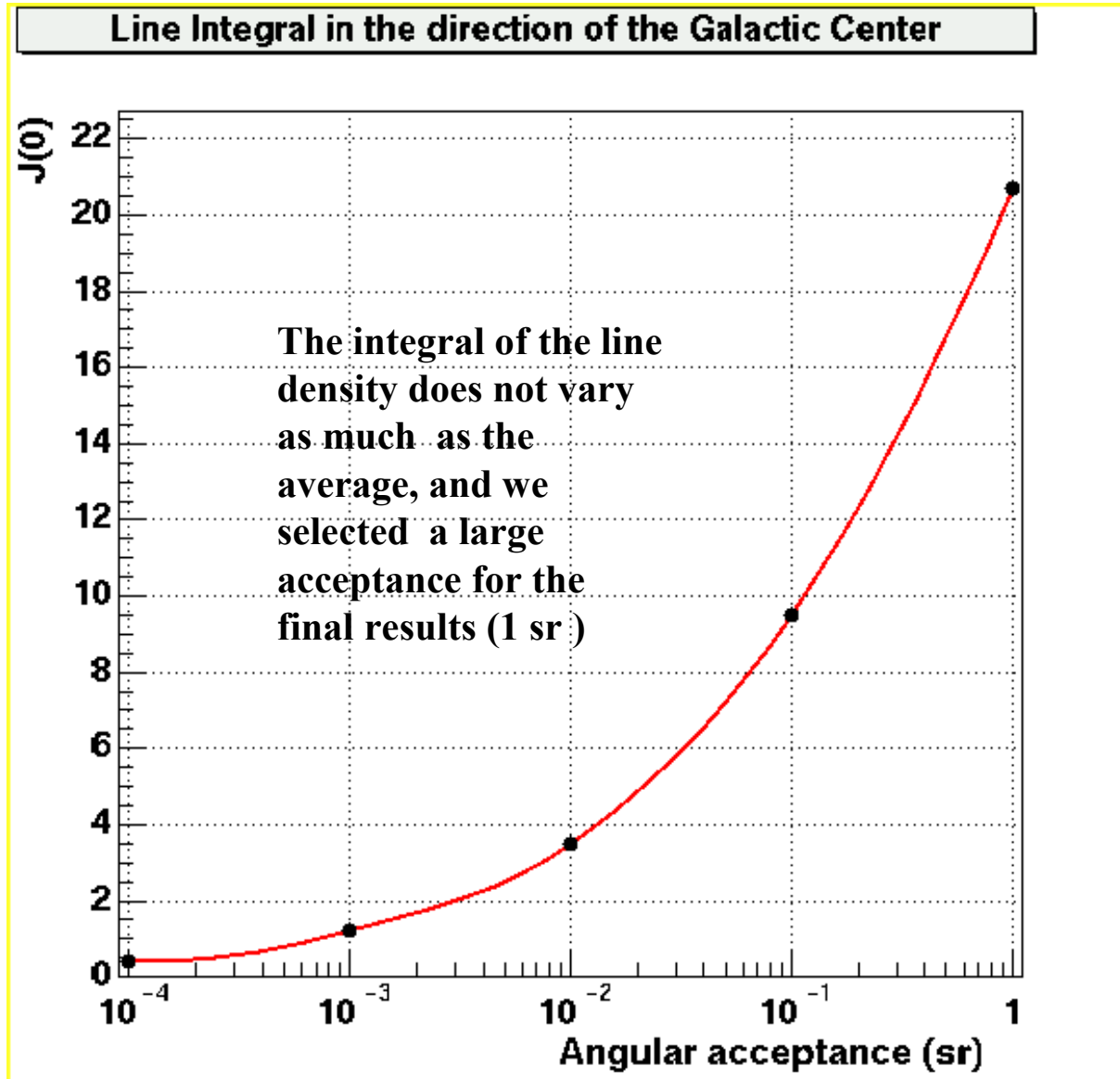
Average Line Integral in the direction of the Galactic Center



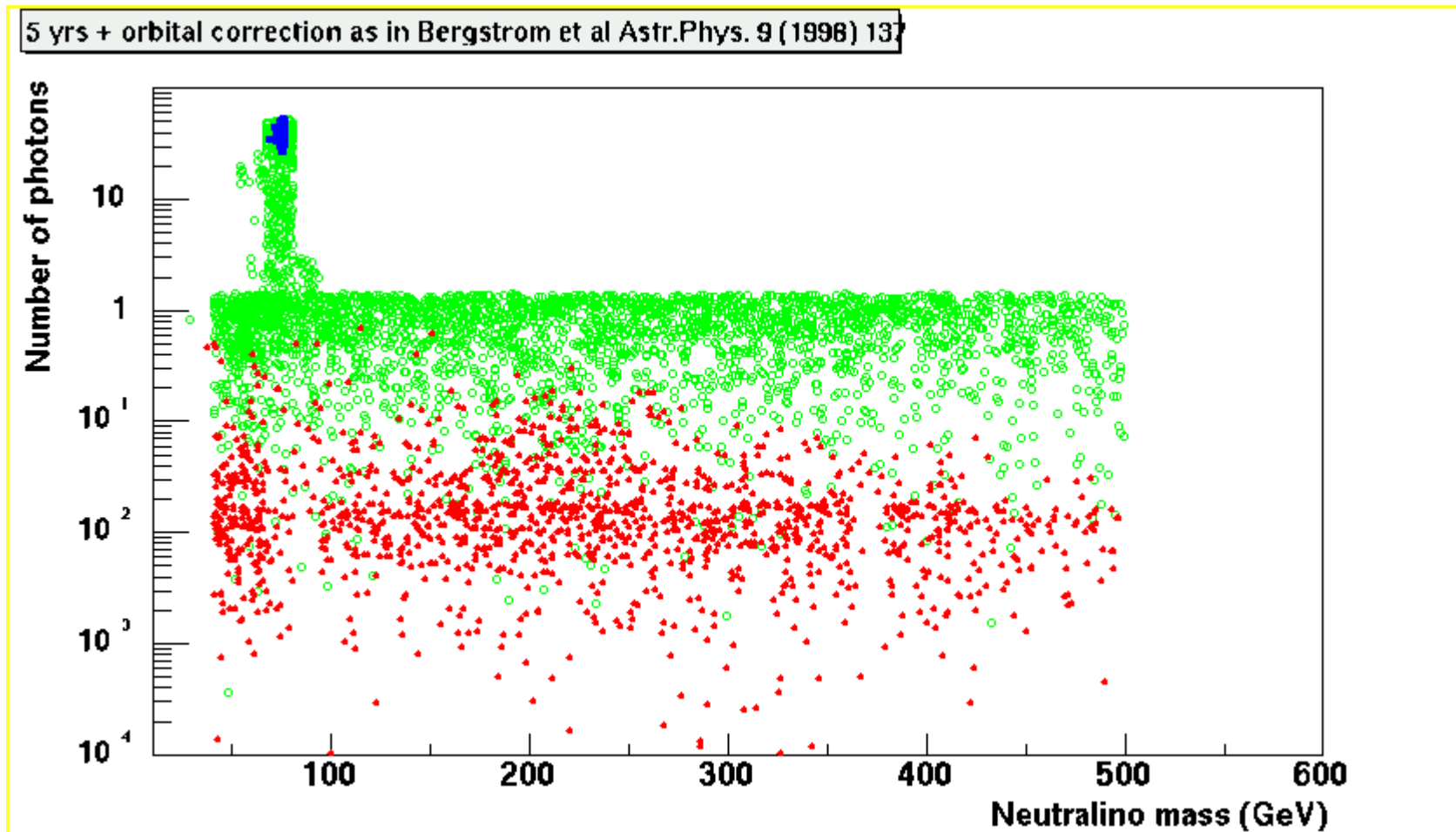
J is averaged over the solid angle (angular acceptance).

Aldo had suggested to use 10^{-5} to enhance the flux, arguing that our PSF is very good but shall we really use the average ?

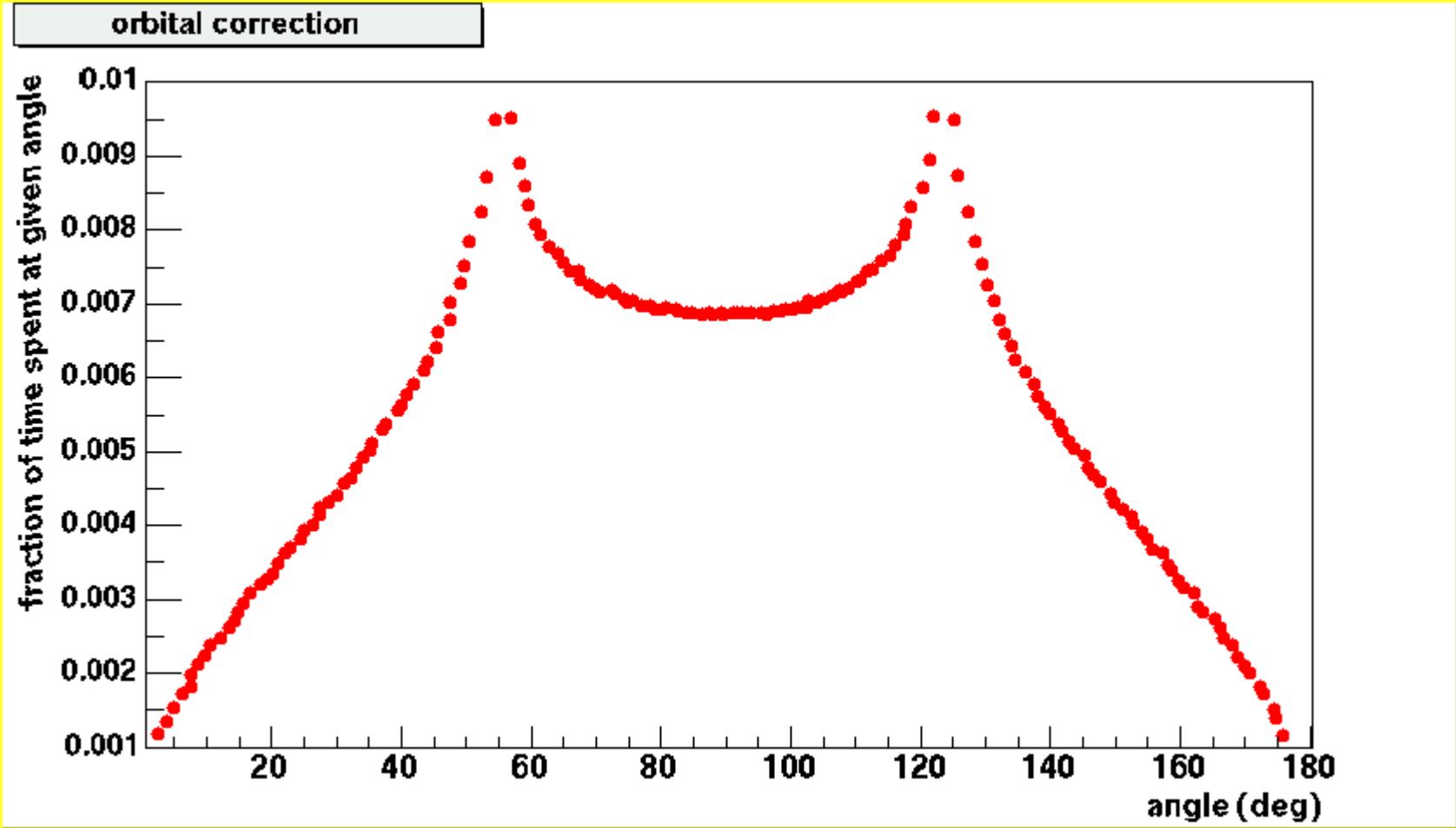
The maximum flux using the line integral (not the average), for the angular acceptance of 0.01 sr was $2 \cdot 10^{-11}$ photons $\text{cm}^{-2} \text{s}^{-1}$. In Bergstrom et al PRD 63 (2001) 083515, using the same smooth NFW profile they obtain $\sim 10^{-11}$ photons $\text{cm}^{-2} \text{s}^{-1} \text{sr}^{-1}$ which is factor of 10 higher than ours.



We used “our” cross sections (seem to be OK), the line integral (not the average) and the estimation from Bergstrom et al that the screening by the Earth of the GC region halves the orbit time **and we obtained not many models with > 10 photons !**



We integrate between 0 and about 47 degrees (~ 2 sr) to get the time we spend looking at the GC with our angular acceptance.



We used “our” cross sections (seem to be OK), the line integral (not the average) and our estimation for the orbit time **and it gets worse by a factor of 2-3 !** Note that our maximum flux corresponded to 10^{-10} photons $\text{cm}^{-2} \text{s}^{-1}$, which is the expected level for the diffuse background.

