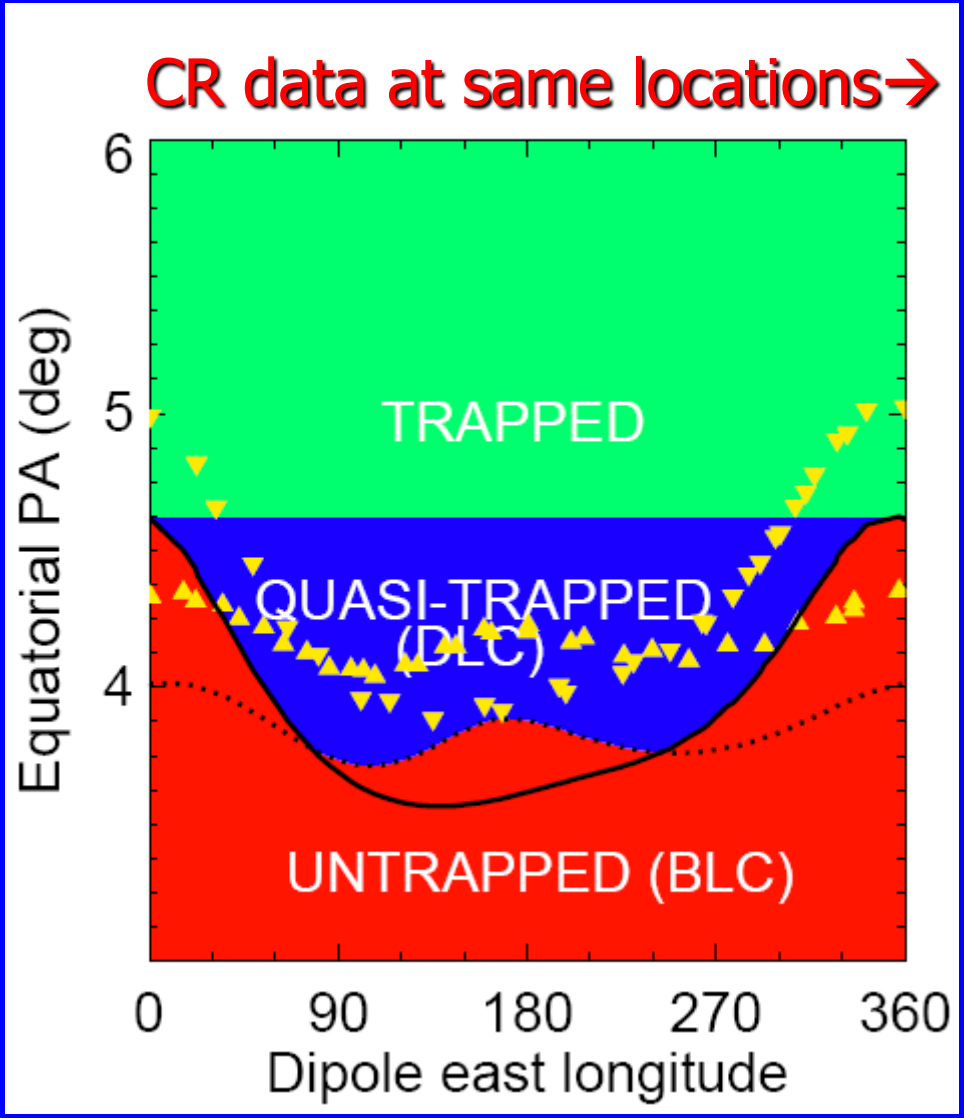
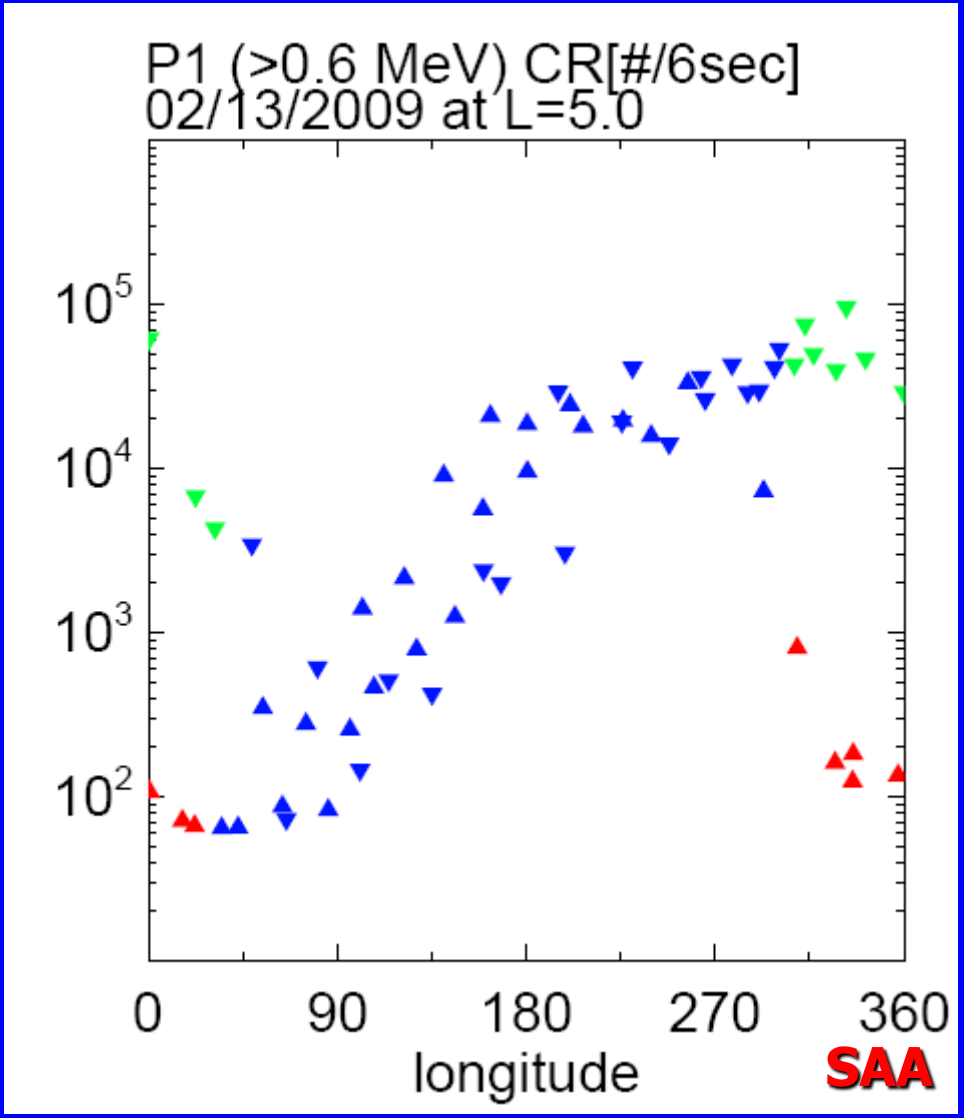
SAMPEX/PET Count Rate Data





- **The relative trapped and quasi-trapped intensities determine the loss rate**

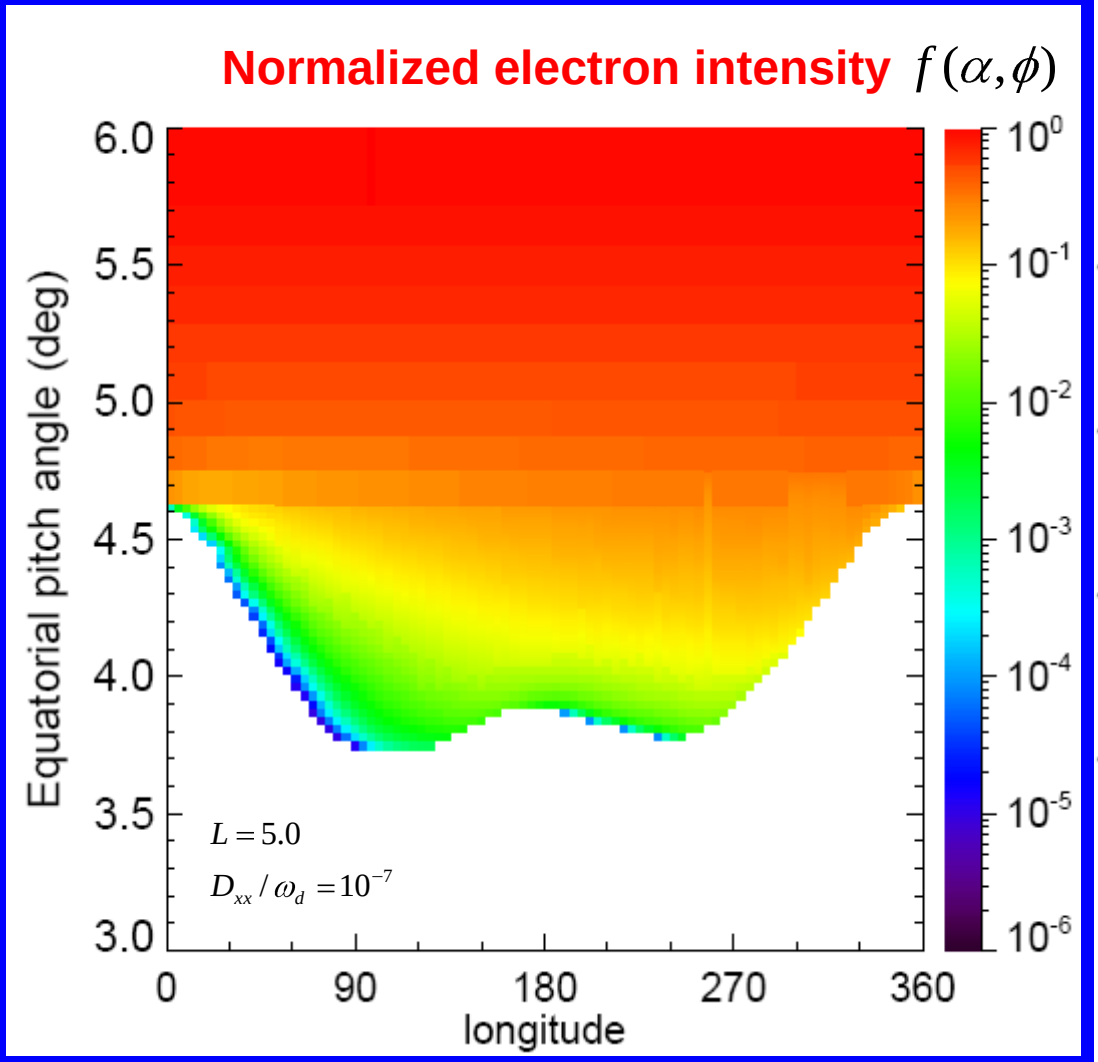
Model of the loss rate and source rate

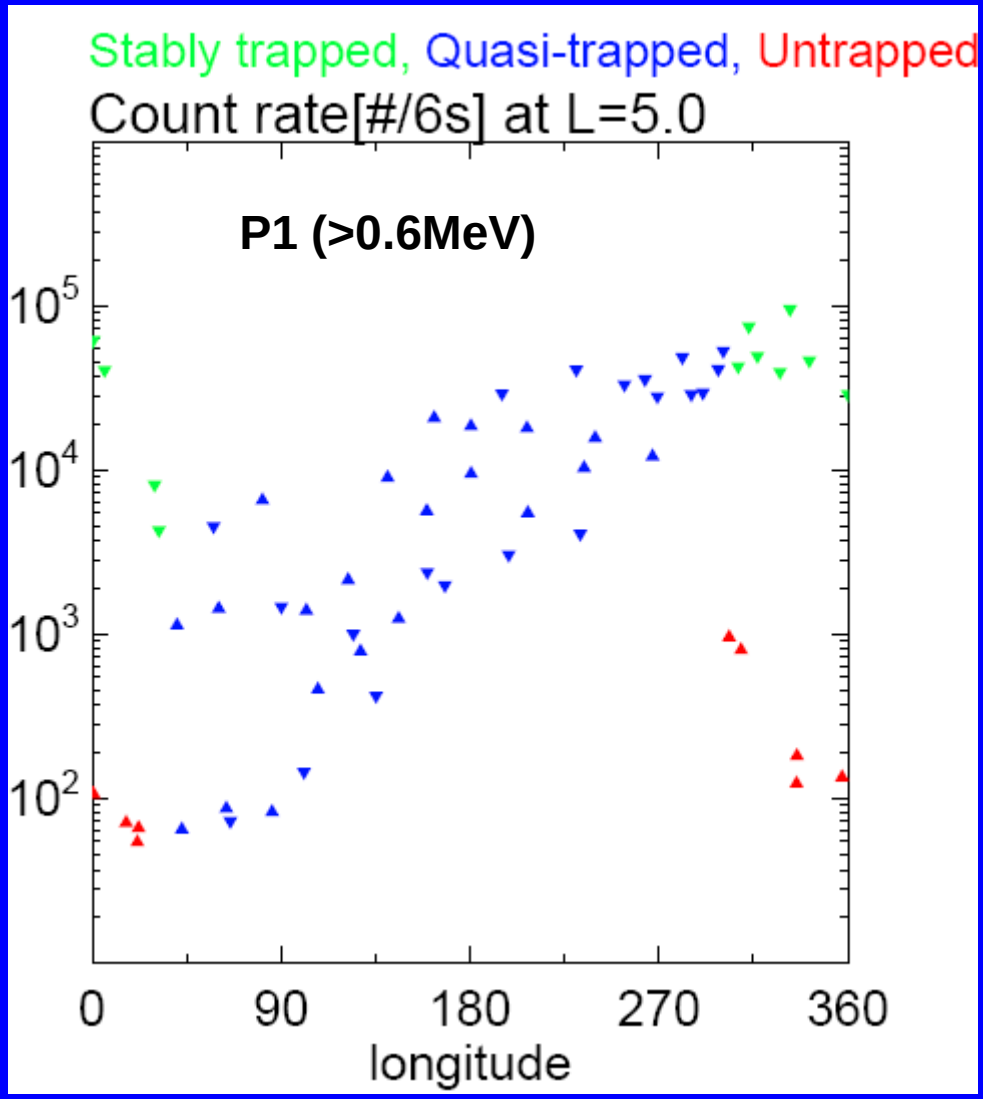
- **Low-altitude electron distribution is a balance of pitch-angle diffusion, azimuthal drift and possible sources:**

$$\text{For given L and E}: \frac{\partial f}{\partial t} + \omega_d \frac{\partial f}{\partial \phi} = \frac{\omega_b}{x} \frac{\partial}{\partial x} \left(\frac{x}{\omega_b} D_{xx} \frac{\partial f}{\partial x} \right) + S$$

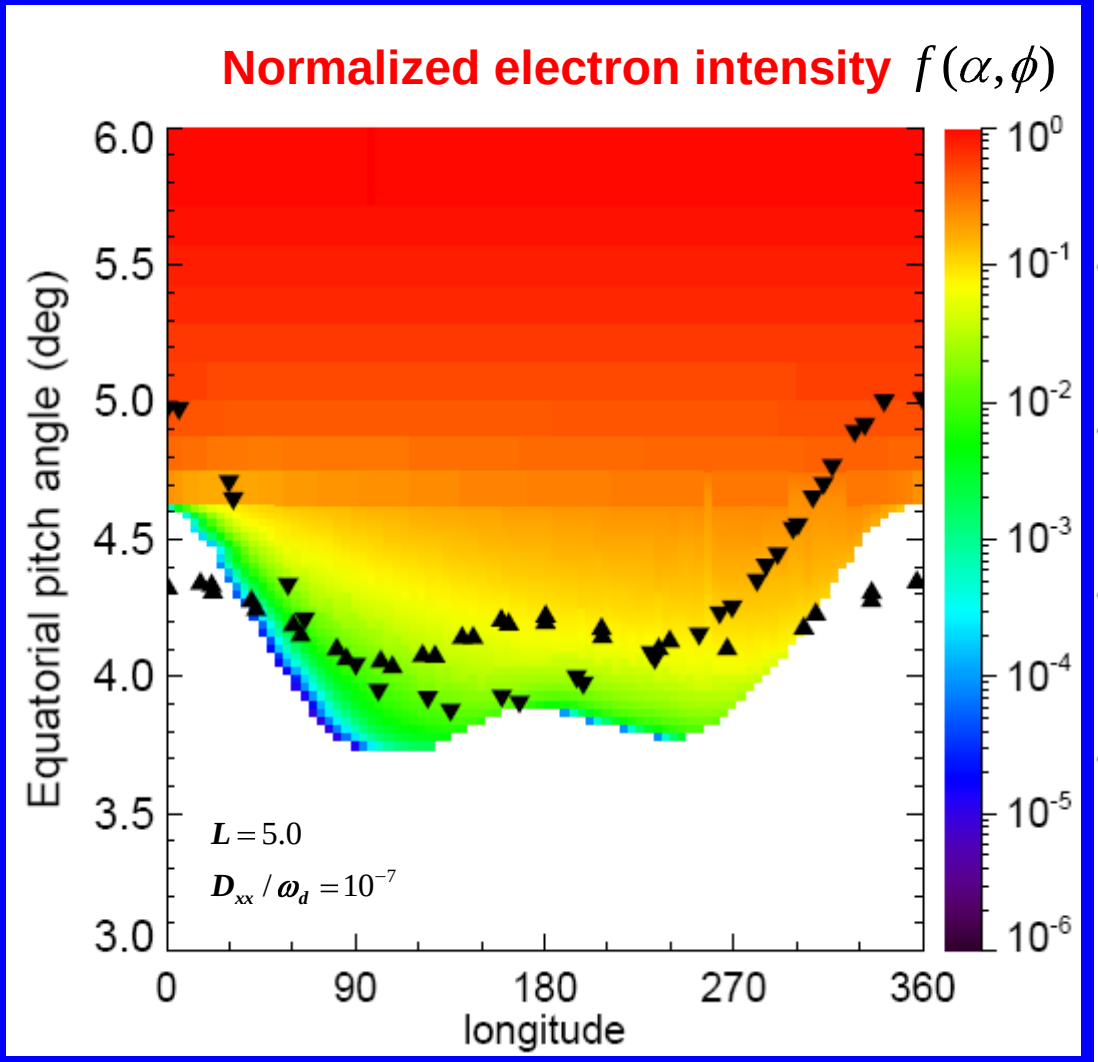
- **Given parameterized D_{xx} and S, this equation can be solved to model the SAMPEX data**
- **Outcomes from the model fit:**
  - **Electron loss rate:** $D_{xx} = D_{\text{dawn/dusk}} E^{-a} (10^{-4} + x^{30})^{-1}$, $x = \cos\alpha_0$
  - **Electron source rate:** $S = S_0 E^{-\upsilon} g_1(x)/p^2$

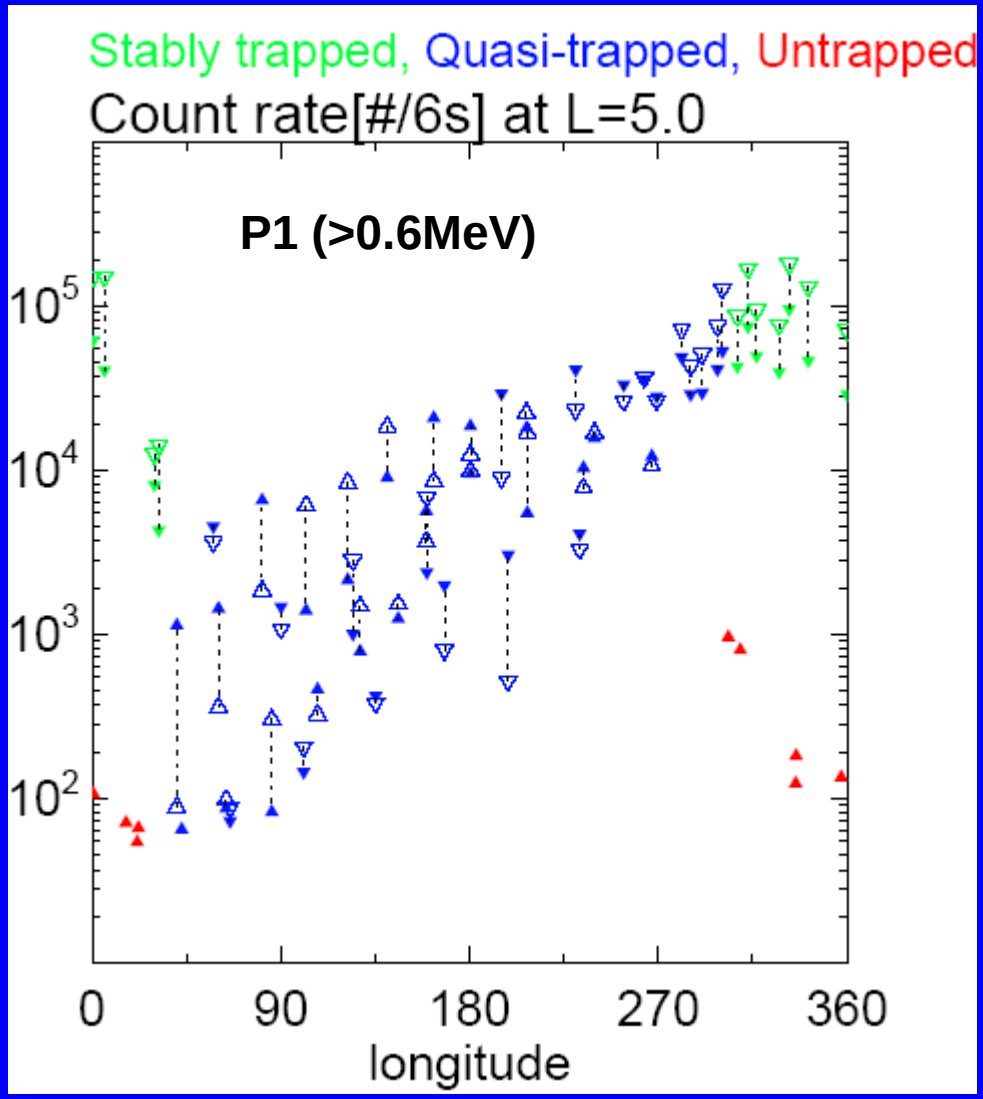
Sample Model Solutions





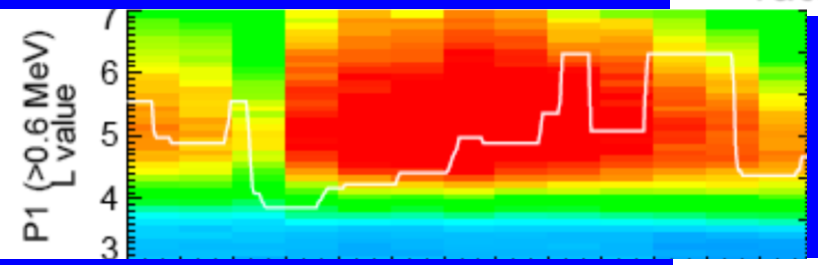
Data and Model Comparison





Model Outcomes

- 6 different energies
- at L=4.5
- Lifetime, energy dependent (~ hr to day).



SAMPEX data

Trapped electron intensity

Source rate

Lifetime

Replenish-time