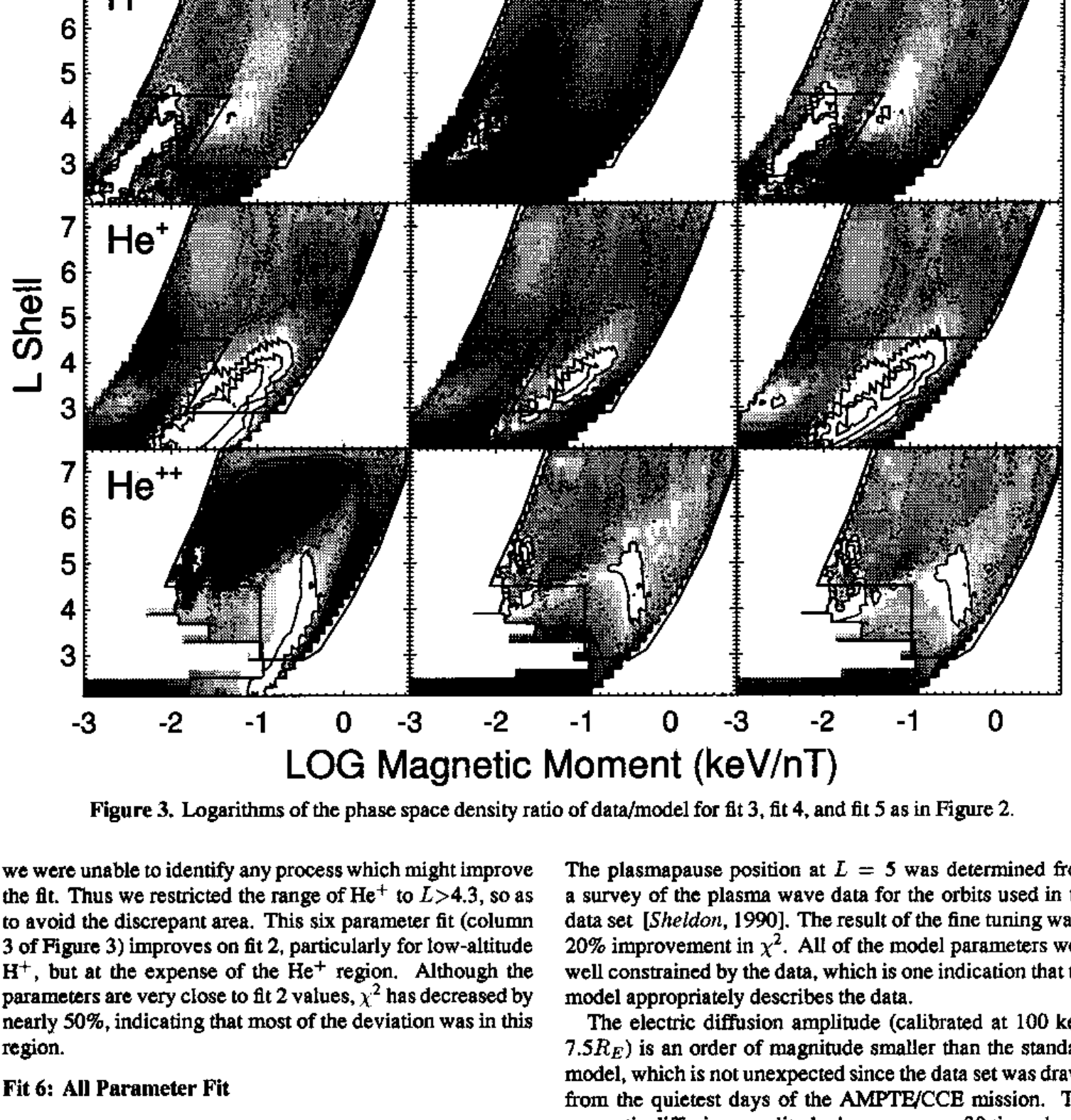

Figure 3. Logarithms of the phase space density ratio of data/model for fit 3, fit 4, and fit 5 as in Figure 2.

we were unable to identify any process which might improve the fit. Thus we restricted the range of He^+ to L>4.3, so as to avoid the discrepant area. This six parameter fit (column 3 of Figure 3) improves on fit 2, particularly for low-altitude H^+, but at the expense of the He^+ region. Although the parameters are very close to fit 2 values, χ^2 has decreased by nearly 50%, indicating that most of the deviation was in this region.

Fit 6: All Parameter Fit

Because the model was sufficiently close to the data that χ^2 was not dominated by outliers, we fit nine adjustable parameters in the model to calculate their relative deviations. Because of limitations of the computer fitting algorithm, we fit six parameters at a time in various combinations to insure that we had located a global minimum in χ^2 space. We also found that the more recent ISEE plasmasphere model [*Carpenter and Anderson*, 1992] for the first time gave a slightly better fit than the GEOS model of paper 1. Thus in this fit alone, we now define the cold plasma density ($n_e = n_p$) to be

$$\begin{aligned} n_p &= \log^{-1}(-0.3145L + 3.9043) \quad L \le 5 \quad (19) \\ &= 16,000/L^{4.5} \qquad\qquad\quad L > 5 \end{aligned}$$

The plasmapause position at $L = 5$ was determined fro a survey of the plasma wave data for the orbits used in t data set [*Sheldon*, 1990]. The result of the fine tuning was 20% improvement in χ^2. All of the model parameters we well constrained by the data, which is one indication that t model appropriately describes the data.

The electric diffusion amplitude (calibrated at 100 ke $7.5R_E$) is an order of magnitude smaller than the standa model, which is not unexpected since the data set was draw from the quietest days of the AMPTE/CCE mission. Th magnetic diffusion amplitude, however, was 30 times larg than the nominal value. Presumably, it is solar wind flu tuations that drive the magnetic component, which may b decoupled from the magnetospheric activity indices used i the selection of this data set, yet it remains an unexpecte result. Since the region over which magnetic diffusion dom nates electric diffusion is restricted to high altitudes and hig energy, this result may arise from the relatively small numb of data points which determine the magnetic diffusion coeff cient. The internal electric fluctuation power shows a steep gradient, p=-1.21, than perhaps expected as discussed in th next section. The remaining parameters, however, were bo well constrained and near nominal expectations.

The fit parameter values of l=2.87 and Ω_M=0.88 hr