space occurs because of the quadrupolar ionospheric field, but for our purposes can safely be ignored.) At large B the ionosphere forms one boundary, whereas the low B boundary is either the tail or the magnetopause. The trajectory of the deepest penetrating ion energy is bracketted by solid lines in real space, and plotted exactly in UB(K) space. The double valued mapping is not ambiguous because the direction of convection reverses sign; particles convect toward larger B on the nightside, and toward weaker B on the dayside, so that when a particle encounters a bounding tangency curve it reverses direction. Asterisks mark the location of the ISEE-1 spacecraft projected in the equatorial plane.

The power of the mapping can be shown in the algorithm for finding the deepest penetrating magnetic moment: (1) Take a straightedge, (2) Adjust the slope such that it is tangent to the upper and lower bounding curves and still intersects the y-axis (B=0) without crossing any forbidden regions, (3) Convert the slope to magnetic moment. This value of magnetic moment is the lowest μ that can access the inner magnetosphere, and defines the inner "edge" calculated in Table 1. In UB(K) space in the inner magnetosphere, only spacecraft locations below this line can "see" the plasmasheet, and thus only higher μ ions can be observed. The range of observable μ can be found by replacing step (2) of the above algorithm: (2a) identify the location of the spacecraft, (2b) find the line tangent to the upper and the line tangent to the lower bounding curves that intersects both spacecraft location and the plasmasheet /13/. The maximum and minimum μ from this calculation are listed in Table 1.

Conclusions

We have shown that the energetic particle peaks observed by ISEE-1 can be explained as convecting plasmasheet ions that have been adiabatically energized as they enter the inner magnetosphere. Using standard magnetic and electric field models, and without adjusting any of the parameters, we obtained remarkable agreement between the data and model predictions, both of the energy and location. Thus global field models of the inner magnetosphere can be empirically tested (and improved) with particle measurements from satellites in elliptical orbits.

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