



**Example 1.** The top panel (a) shows a 2-dimensional cut of electron density of the sub-solar magnetosheath through the GSM XZ plane based on a 3-dimensional MHD model [Raeder *et al.*, 1997]. The orbits, instantaneous positions, and ray paths between sixteen satellites are superimposed. Panel (b) shows the reconstructed density based solely on the 120 simulated total electron count (TEC) measurements. The spacecraft positions are indicated with circles and the pixel centers with points. Panel (c) displays the error between the original and reconstructed image. The error is smallest where the ray path concentration is highest. In this example, the correlation between the reconstructed image (b) and the original image (a) is 0.99.