Next, we wish to study the field-aligned density distribution of a plasmaspheric trough. To do this, we need to identify an orbit from the IMAGE pass through the density trough imaged by EUV and EPI data operating in an adaptive mode. The only candidate for this type of study is 06-11 June 2000. Figure 11 shows EUV observations of the development and evolution of the plasmaspheric density trough in question. Verification of IMAGE passage through this feature occurred on 11 June 2000 yet its location is unclear.

Figure 14 shows the EPI dynamic spectrogram early on 11 June 2000 and shows the characteristic strong signature of plasma model-motion-synchronous precipitation (e.g., Carpenter et al., 2000). The model simulation shows an approximately 6-hour period of intense precipitation located in the field-aligned plasma density distribution of the plasmasphere. The intensity of the plasma density distribution appears to peak at the dawnside of the midnight meridian, yet this is not characteristic of the density distribution imaged by the plasma model. This period of intense precipitation is the result of the RPI detection of guided echoes from the local hemisphere at 06:32:25 on 24 May 2000.

In light of Figure 10, preliminary modeling of the thermal and ring current plasmas for the 06:34 UT time period for 24 May 2000 (See Figure 11) indicates the presence of a tongue of 27–40 keV ring current plasma in the equatorial distribution of the density trough. We now look for a signature of this ring current population in HENA data.

HENA observations for 24 May 2000 are presented in Figure 12. Panel (a) shows the equatorial plasma distribution with simulated spacecraft trajectory. The model indicates the presence of a tongue of ring current plasma associated with this feature early on 10 June 2001 has yet to be feature early on 10 June 2001 has yet to be verified. Figure 13 shows the RPI dynamic spectrogram acquired early 10 June 2001 when IMAGE is believed to have flown through the plasmaspheric trough prior to the imaging of the trough by EUV. The RPI observation shows a guided echo signature in the field-aligned plasma density distribution of the trough event, RPI detected guided echoes from the local hemisphere at 06:32:25 on 24 May 2000.

Guided echo signatures have been seen in sweep frequency receiver spectrograms [e.g., Carpenter et al., 2000]. During this trough event, RPI detected guided echoes from the local hemisphere at 06:32:25 on 24 May 2000. The guided echo signatures were evident during the sweep frequency receiver sweep and the high-latitude emission located in the equatorial plane. The guided echo signatures were evident during a period of intense precipitation located in the field-aligned density distribution of the plasmasphere. The intensity of the plasma density distribution appears to peak at the dawnside of the midnight meridian, yet this is not characteristic of the density distribution imaged by the plasma model. This period of intense precipitation is the result of the RPI detection of guided echoes from the local hemisphere at 06:32:25 on 24 May 2000.

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