

Plasmaspheric plume features simultaneously observed by CPMN ground magnetometer networks and IMAGE EUV

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We have compared two quantities which were simultaneously observed by two different instruments at the same point of the plasmaspheric plume. One of the two quantities is the field-line eigenfrequency, and the other is the intensity obtained by the IMAGE-satellite Extreme Ultraviolet Imager (IMAGE/EUV). The field-line eigenfrequency was obtained by applying the dual-station H-power ratio method to geomagnetic data which were observed by two ground magnetometers (at Tixie(geomagnetic longitude=65.65, geomagnetic latitude=196.90, L value=5.98) and Chokurdakh(64.66, 212.14, 5.55)) which belong to the Circumpan Pacific Magnetometer Network (CPMN). We used the IMAGE/EUV intensity data at the equatorial footpoint of the field-line whose eigenfrequency we observed from CPMN stations. The IMAGE/EUV intensity is roughly proportional to the equatorial density of He⁺. As a result of the IMAGE/EUV analysis, we found that the intensity showed an increase-then-decrease pattern. On the other hand, as a result of analyzing the simultaneously observed CPMN ground magnetometer data, we found that the eigenfrequency showed a coherent decrease-then-increase pattern. Since this pattern can take place if the equatorial plasma density along the field-line increased and then decreased, these two results are qualitatively consistent. In addition, the H-power ratio showed an offset when either Tixie or Chokurdakh (these stations have a longitudinal separation) stayed inside the plume. This feature is explained if the overall ULF wave power was weaker in the plume than in the surrounding trough. With the above findings, this paper constitutes the first to identify a plume from both the space and the ground.