Cluster Multipoint Measurements of Static Structures and Alfvén Waves Above the Aurora.

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Cluster multipoint measurements allow us to begin to resolve the dilemma of the spatio-temporal ambiguity associated with single-satellite measurements. We present electric and magnetic field data from several Cluster crossings of the auroral zone, with different scales of the satellite separation, and show how the field variations in some cases are associated with static current systems, and in other cases with temporal variations. We show that many of these temporal variations are likely to be Alfvén waves, and using the multipoint measurements we can study various properites of Alfvén waves above the aurora, which are not possible to get at from single-point measurements, such as the full wave vector and the perpendicular phase velocity, and the large-scale geometry of the wave propagation region.