

A quantification method for the properties of diffuse and pulsating aurorae based on auroral image data

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The auroral images provide much information on the state of the magnetosphere-ionosphere system. However, since the variations of aurorae are highly complicated, it was difficult to quantify the dynamical properties of the aurorae. We are developing a technique for obtaining quantitative metrics about various auroral properties by analyzing a sequence of auroral images taken with high temporal resolution. We introduce a state space model to describe the translational motion of diffuse aurorae, and estimate the translational velocity by using an algorithm which approximates the Kalman filter. We also extract the features of pulsating aurora, patches of pulsating aurora by using a technique based on a sparse modelling. We will report some results of our analyses.

Keywords: pulsating aurora, kalman filter, sparse modelling