Simulated aurora observations with the multi-spectral auroral camera onboard the INDEX satellite

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In order to investigate the dynamics of fine-scale auroral arcs, we have developed a multi-spectral auroral camera (MAC) to be onboard the INDEX satellite which will be launched by a H2A rocket as a piggyback into polar orbit at an altitude of 680 km. In the nightside auroral region, MAC will observed monochromatic auroral images at three wavelengths, that is, N2+ 1N band (427.8 nm), OI (557.7 nm), and N2 1P band (670 nm), with high time and spatial resolutions.

The MAC will operate with two different observation modes as follows. One is the image / particle simultaneous measurement mode. In this mode, the satellite attitude is controlled to direct the field-of-view of MAC to the geomagnetic footprint. The other is the auroral height distribution measurement mode. In this mode, the satellite attitude rotates around the axis almost parallel to the orbital path to direct the field-of-view of MAC to the Earth's limb. On the other hand, INDEX satellite, which is 3-axis stabilized, has a limitation in attitude such that the normal to the satellite's solar-panel must be within 15 degrees with respect to the direction of the sun.

We have made the simulation of aurora observation by MAC on the two observation modes with given limitation.Possible observation conditions obtained by the simulation will be prezented.