M138-021 **Room: 201B** **Time: May 21 11:15-11:30**

Development of Finishing Process of MgF_2 Surfaces for a Far Ultraviolet Schmidt Camera

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A far ultraviolet imager (FUVI) is proposed for a satellite-borne sensor to depict time and spatial extent of plasma bubbles and traveling ionospheric disturbances. Since intensity of OI 135.6 nm night airglow is proportional to the square of electron density in the F-layer, OI 135.6 nm night airglow is suitable for imagery of the ionosphere from a satellite. However, OI 135.6 nm night airglow has intensity of only 10R in the mid-latitudes. Exposure time as long as 20 min is required to take a global snapshot of OI 135.6 nm nightglow even by a highly sensitive camera onboard a three-axis stabilized satellite. Strong H Lyman alpha (121.6 nm) and OI 130.4 nm geocoronal emissions should be carefully eliminated from the faint OI 135.6 nm emission. A geosynchronous orbit in which observation geometry is constant is the most suitable for the remote sensing of global airglow distribution.

From the requirement mentioned above an optical layout of a Schmidt camera is adopted to achieve a fast and wide-field optics with moderate spatial resolution, but it is found that production of a correcting plate for a pure Schmidt camera is quite difficult especially for that can be used in the FUV region where wavelength of light is one-fourth of that of visible light. We started from an optical layout of a pure Schmidt camera, and modified it so that a correction amount to form an aspherical surface can be as small as possible without severe degradation in a spatial resolution. Then we designed a null-lens system which will be used in evaluation of a Schmidt correcting plate by an interferometer.

In order to establish technology to manufacture the FUV Schmidt camera we started development of polishing process of a MgF_2 plate by combination of diamond grinding and magneto-rheological finishing (MRF). In the first experiment a plane surface on a MgF_2 plate was manufactured by this process and its surface quality was tested. The surface was as smooth as that finished by a standard pitch finishing method, but a slight residual like a cross was found. Then in the second experiment the residual was closely investigated to distinguish whether it is a real or false image. We found that the residual is real and can be corrected by controlling the MRF process. A spherical surface is now being finished by the same technique. The result will be presented.