Wind and Temperature Measurements in the Thermosphere and Mesosphere Using Three Channel Fabry-Perot Interferometer

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We are developing a three channel imaging Fabry-Perot interferometer to measure atmospheric wind and temperature in the mesosphere and the thermosphere through nocturnal airglow emissions. The interferometer measures two-dimensional wind and temperature for wavelengths at 630.0nm (altitude: 200-300km), 557.7nm (96km), and 839.9nm (86km) simultaneously using three Liquid-Nitrogen (LN2) cooled CCD cameras. From the test operation on January - July, 1998, we found that the CCD sensor moves due to temperature variation of LN2. The motion of the CCD is calibrated using fringes from frequency-stabilized He-Ne laser. In the presentation we show initial results of the measurement for a traveling ionospheric disturbance event observed in the 630nm airglow on May 22, 1998 at Shigaraki, Japan.

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