Wind and Temperature Measurements in the Thermosphere and the Mesosphere Using a Fabry-Perot Interferometer at Shigaraki - 4

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We have developed an imaging Fabry-Perot interferometer (FPI) to measure atmospheric wind and temperature in the mesosphere and the thermosphere through nocturnal airglow emissions. From an automatic operation data from June 1999 to May 2000, we conclude that the data from the imaging FPI contain some offsets in the wind and temperature values, while relative variations of these values are quite similar to those expected from HWM90 and MSIS86. To remove the offset problem, we have revised the optics of the interferometer from imaging (with a fish-eye lens) to scanning (with a narrow field-of-view lens and a mirror) since October 2000. In the presentation, we show the statistical data of the imaging FPI and comparison of wind data obtained by the scanning FPI and the MU radar.

We have developed an imaging Fabry-Perot interferometer (FPI) 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 630.0 nm (OI, altitude: 200-300 km), 557.7 nm (OI, 96 km), and 839.9 nm (OH, 86 km) simultaneously using three cooled-CCD cameras. From an automatic operation data from June 1999 to May 2000, we conclude that the data from the imaging FPI contain some offsets in the wind and temperature values, while relative variations of these values are quite similar to those expected from HWM90 and MSIS86. To remove the offset problem, we have revised the optics of the interferometer from imaging (with a fish-eye lens) to scanning (with a narrow field-of-view lens and a mirror) since October 2000. In the presentation, we show the statistical data of the imaging FPI and comparison of wind data obtained by the scanning FPI and the MU radar.