Development of four Fabry-Perot interferometers for measurements of neutral wind and temperature at high and low latitudes

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We are developing four Fabry-Perot interferometers (FPIs) in 2007-2009 to measure winds and temperatures in the thermosphere and winds in the mesosphere through airglow/aurora emissions at wavelengths of 557.7 nm and 630.0 nm. One FPI with 116mm etalon were installed at the EISCAT Tromso site on January 12, 2009, for coordinated measurements with the EISCAT radar. The other three FPIs with 70mm etalons will be installed in Indonesia, Thailand, and Australia for wind and temperature measurements at conjugate middle latitudes and at the equator. The FPIs use low-noise CCDs with 1024 x 1024 pixels and 4-stage thermoelectric cooling system, which can cool the CCD temperature down to -80C. The large maximum incident angle (1.4 degree) to the etalon increases the sensitivity of the FPIs. In the presentation, we describe details of these instrumentations and show initial results from obtained at the EISCAT Tromso site.