R005-P03
ポスター 3 ：9/26　AM1/AM2 （9:00-12:30）

Na ライダーの昼間観測に用いる Faraday filter の透過率詳細測定

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Spatial transmission pattern measurements of a Faraday filter for Na lidar daytime observations

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A Na lidar at Tromsoe is upgrading the receiver system for the thin Na atom observations in the lower thermosphere (<200km). The Na atom density at this altitude region is expected to be only ˜2-3 atoms/cm3 compared with ˜2,000 atoms/cm3 at the Na layer peak (˜90 km). To achieve the high S/N ratio measurement, even at nighttime, an ultra-narrowband optical filter, such as a Faraday filter, is necessary to reject the background skylight. The Faraday filter comprises a heated Na cell in a strong magnetic field (i.e., ˜200 mT) between two polarizers. The Faraday rotation and the Zeeman effect can achieve ultra-narrow optical bandpass (˜10 GHz or ˜0.01nm at 589 nm).

We assembled a transmission diagnosis system at 589 nm wavelength based on two narrowband DFB lasers (1064 nm and 1319 nm) at the RIKEN facility. We conducted the transmission profile measurements of the Faraday filter by changing the optical pass in the filter.

In this talk, we discuss the results of the transmission measurements and the filter's performances. We present a newly developed Na cell.