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Toward Comparison of RAMAN and HSRL LIDAR Technique for CTA-Type Atmospheric Monitoring

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This work describes the HSRL activity at NTUA and the possibility to receive simultaneously data with a RAMAN lidar operating at NTUA campus. We believe that such a preliminary study would be a useful study as the hardware for RAMAN LIDAR is already available and operating at NTUA and significant progress has been made in development HSRL prototypes for 532 and 355 nm Fabry-Perot receivers while the laser transmitters are independent from the ones used for the RAMAN LIDAR system. The Raman LIDAR data have been published in several Journals and include results in the framework of EARLINET EU funded project. The Raman LIDAR has capabilities to record aerosol extinction, ozon and water vapour profiles. The present phase of the work focuses on the study for the mounting of both the aerosol and molecular channel etalon, a receiver Newtonian telescope and optical fiber to transmit to the two channels the collected signal from the scattering volume by the telescope. Preliminary lab results with He-Ne laser with several longitudinal modes analyzed by a 50 mm spacer etalon are discussed. The UV sensitive etalon performance is studied. The mount technique considered for the molecular UV channel is of the type of Hansen mount applied to the Dynamics Explorer etalon with 2 mm spacer thickness, while for the aerosol type we have followed the 10 cm hollow Zerodure cylinder spacer. The coating technique for the aerosol channel etalon plate pair has been selected to correspond to soft coating with proposed reflectance curve peaking at 380 nm ($R=98\%$), while at 355 nm $R=92\%$.

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