MMARIA: A multi-static, multi-frequency meteor radar approach to improve the MLT wind field measurements

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Traditionally mean values of the mesosphere and lower thermosphere winds over the radar volume are obtained using monostatic specular meteor radars. Such observing volume consist of a few hundreds of kilometers in radius. Moreover the differences between measured radial velocities and the expected radial velocities from the measured mean winds are used to derive properties of gravity wave momentum fluxes. Recently, Stober and Chau [2015] have proposed to use a multi-static approach, MMARIA (Multi-static, Multi-frequency Agile Radar to Investigate the Atmosphere) to retrieve horizontally resolved wind fields, where most of the radar volume is observed from different viewing angles. Similar results could be obtained if measurements from close-by monostatic systems are combined. In this work we present results from a first-order Taylor expansion (gradient method) of the horizontal wind field in northern Norway, i.e., combining the results from Andenes and Tromso specular meteor radar systems. In addition, we present an update of the deployment plans of our MMARIA network in Germany, with emphasis on the engineering developments and challenges.

References

Stober, G., and J. L. Chau. 2015: *Radio Science*, **50**, doi:10.1002/2014RS005591.