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Some aspects of long-term scintillometer operation and data quality control

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The turbulent fluxes of heat and water vapour play an important role in the energy and water cycle at various scales and can be considered as key parameters to characterise land surface – atmosphere interaction processes. Scintillometry appears to be the only measurement technique presently available for the operational determination of these fluxes at a horizontal scale of a few kilometres needed to validate fluxes simulated by regional atmospheric models or derived from satellite images.

Different types of optical scintillometers have been in operation at the Meteorological Observatory Lindenberg – Richard-Assmann-Observatory (MOL-RAO) over periods of 5 to 15 years. These include
• a laser scintillometer installed at the MOL-RAO boundary layer field site (GM) Falkenberg over a path of 112 m used to derive both the sensible heat and momentum fluxes at field scale
• two types of optical large-aperture scintillometers operated over a 4.8 km path between the GM Falkenberg and MOL-RAO sites providing spatial integration over a heterogeneous land surface to derive the regional scale sensible heat flux.
The presentation will give an overview of the operational experiences with these instruments, including data availability and quality control aspects. Examples will demonstrate the use of the scintillometer-based fluxes for the validation of NWP model results.