



Applications

- Direct measurement of evapotranspiration (latent heat flux, L_vE)
- Significant variable for
 - Agriculture
 - Irrigation
 - Water management
 - Hydrology
 - Weather forecasting
 - Radiation budget

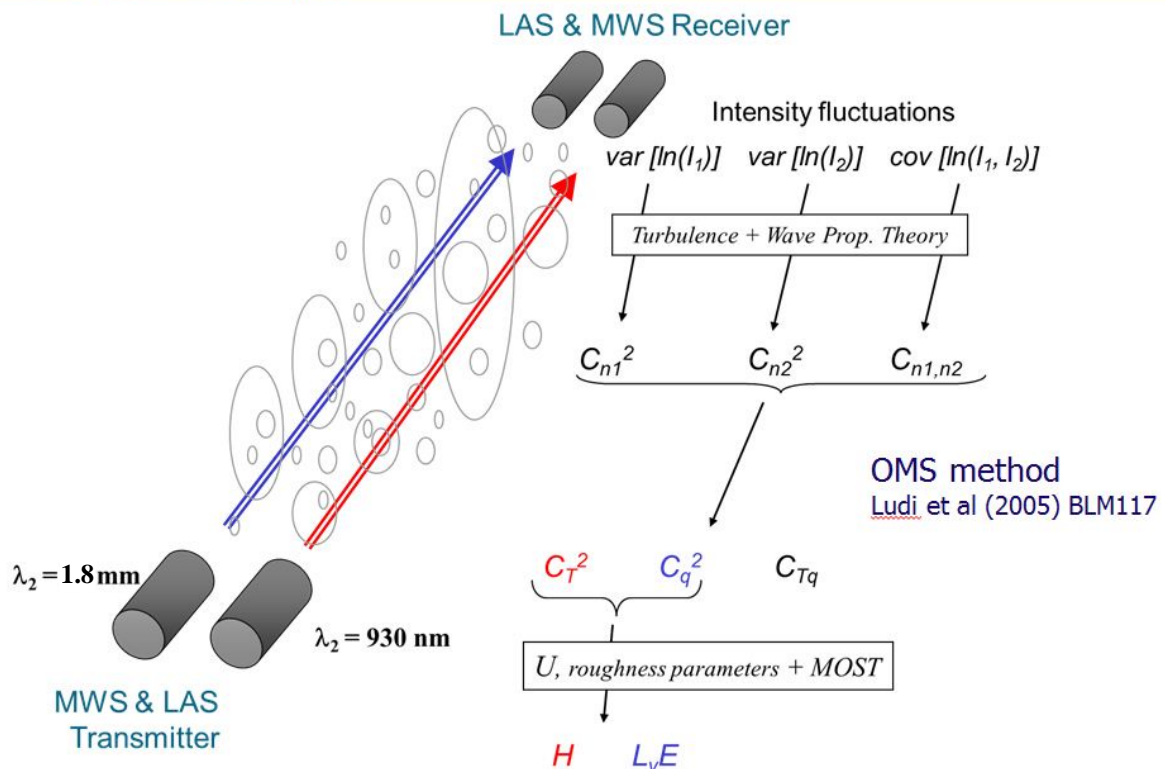


Concept and Features

- Transmit/Receiver system
 - Transmitter: Constant signal
 - Receiver: observes fluctuations
- Information Content:
Turbulence modulates the refractive index of air, which leads to intensity fluctuations
- Method needs simultaneous measurement of sensible heat flux H by large-aperture optical scintillometer (LAS)
- High frequency for good co-spectrum with LAS and small beam
- Uses hardware developments from space projects (166 GHz LO-driver for 664 GHz ICI channels, 150 GHz receiver front end technology)
- Data Interface: analogue or digital

RPG and Wageningen University (The Netherlands) have developed this prototype of a microwave scintillation system in the OMS (Optical and Microwave Scintillation) project, jointly funded by STW, The Netherlands, and RPG. The instrument will be available to the market in early 2013.

OMS System Description



Detailed Instrument Specifications

Parameter	Specification
Frequency	160.8 GHz ($\lambda=1.86 \text{ mm}$)
Radiated power	30 – 60 mW
Antenna type	Cassegrain with 300 mm aperture
Antenna gain	51 dB
Beam width	1.0° FWHM
Detection bandwidth	10 kHz
Frequency stability	< 1 kHz
Gain stability	> 2.5×10^{-6}
Temperature stability	< 0.03 K (two-stage control)
Power supply	24 V DC
Power consumption	approx. 50 W with thermal control
Output signals	AC: 0.005 to 200 Hz time series DC: averaged power level
Type of installation	Line of sight Tx/Rx system (transmit/receive)
Baseline length	1 to 10 km