EMS Annual Meeting Abstracts,
Vol. 6, EMS2009-395-1, 2009
9th EMS / 9th ECAM

9th EMS Annual Meeting
9TH EUROPEAN CONFERENCE ON Applications of Meteorology
High resolution meteorology
- applications and services

Applicability of a displaced-beam laser scintillometer in a sparse tall Mediterranean vegetation

C. Cammalleri (1), C. Agnese (2), G. D'Urso (3), T. Georgiadis (4), G. La Loggia (1), M. Sciortino (5), and H.A.R. de Bruin (6)

(1) Dept. of Hydraulic Engineering and Environmental Applications (DIIAA), Università degli Studi di Palermo, Palermo, Italy (cammalleri@idra.unipa.it/+390916657749), (2) Dept. of Engineering and Agro-Forestal Technology (ITAF), Università degli Studi di Palermo, Palermo, Italy, (3) Dept. of Agricultural Engineering and Agronomy, Università degli Studi di Napoli "Federico II", Napoli, Italy, (4) Istituto di Biometeorologia (IBIMET) - CNR, Bologna, Italy, (5) Ente per le Nuove Tecnologie, l'Energia e l'Ambiente (ENEA) - C.R.Casaccia, Rome, Italy, (6) Associate Professor Emeritus, Wageningen University, Wageningen, The Netherlands, freelance consultant Bilthoven.

Recent studies showed that the sensible heat flux (H) measured with an array of eddy-correlation system has an high spatial and temporal variability over sparse tall vegetation, such as olive trees, whereas Hdetermined with a displaced-beam laser scintillometer (DBLS) appeared to behave more stable. In this study, the results are shown of two field experiments performed over an olive tree plantation in Sicily in 2007 and 2008, in order to investigate the applicability of a DBSL in combination with remote sensing techniques for the actual evapotranspiration assessment. In 2007 the laser beams was closer to the top of the canopy than in 2008.

Various aspects of the scintillation method will be discussed, such as uncertainty about Monin-Obukhov similarity relations for dissipation of kinetic turbulence energy (ε), the structure parameter of temperature (C_T^2), effects of the roughness sub-layer and the outer scale of turbulence.

Finally, a practical method will be proposed for routine applications in agriculture of the DBLS over sparse tall Mediterranean vegetation.