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The SWEX at the area of Eastern Poland: Comparison of soil moisture obtained from ground measurements and SMOS satellite data*

J.B. Usowicz (1), W. Marczewski (2), B. Usowicz (3), M.I. Lukowski (3), J. Lipiec (3), and J. Slominski (2)

(1) Torun Centre of Astronomy of the Nicolaus Copernicus University, Gagarina 11, 87-100 Torun, Poland (jerzy.usowicz@gmail.com), (2) Space Research Centre, Polish Academy of Sciences, Bartycka 18A, 00-716 Warsaw, Poland, (3) Institute of Agrophysics Polish Academy of Sciences, Doswiadczalna 4, 20-290 Lublin, Poland

Soil moisture, together with soil and vegetation characteristics, plays an important role in exchange of water and energy between the land surface and the atmospheric boundary layer. Accurate knowledge of current and future spatial and temporal variation in soil moisture is not well known, nor easy to measure or predict. Knowledge of soil moisture in surface and root zone soil moisture is critical for achieving sustainable land and water management. The importance of SM is so high that this ECV is recommended by GCOS (Global Climate Observing System) to any attempts of evaluating of effects the climate change, and therefore it is one of the goals for observing the Earth by the ESA SMOS Mission (Soil Moisture and Ocean Salinity), globally. SMOS provides its observations by means of the interferometric radiometry method (1.4 GHz) from the orbit. In parallel, ten ground based stations are kept by IA PAN, in area of the Eastern Wall in Poland, in order to validate SMOS data and for other ground based agrophysical purposes. Soil moisture measurements obtained from ground and satellite measurements from SMOS were compared using Bland-Altman method of agreement, concordance correlation coefficient (CCC) and total deviation index (TDI). Observed similar changes in soil moisture, but the values obtained from satellite measurements were lower. Minor differences between the compared data are at higher moisture contents of soil and they grow with decreasing soil moisture. Soil moisture trends are maintained in the individual stations. Such distributions of soil moisture were mainly related to soil type.
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