



RFI in SMOS data over Poland

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Since the SMOS mission was launched in 2009 scale of radio-magnetic interference (further referred as RFI) in L-band has become apparent. Main goal of the mission is to provide permanent monitoring of soil moisture, however retrieval process of geophysical parameters is strongly affected by RFI sources.

Uncertified wireless communication systems as well as improperly maintained communication facilities are main source of unwanted emissions in restricted L-band (1.400-1.427 GHz). Complex analysis of soil moisture over Poland is very difficult due to high RFI ratio. In June 2010 action had been taken to rectify the situation. Formal cooperation between ESA and governmental agency UKE (Office of Electronic Communications) had been established.

Since the DGG pixel covers more than 190 km² exact localization of interference source is hardly feasible. SMOS SRC PAS group is focused on statistical characterization of RFI and identification of potential sources over Poland. Proposed approach is based on polarimetric characteristics of notorious interference sources. Investigation is carried out on brightness temperature in the Earth and satellite frame and its correlation with RFI SMOS L2 products (N_RFI_X, N_RFI_Y - counts of deleted TB due to suspected RFI). Among analyzed time series, 19 permanent powerful sources has been distinguished, with TB permanently exceeding 450 K. Due to this fact complex analysis of soil moisture over Poland is very difficult. Occasionally activity of RFI sources results even in registrations of TB 20 000 K. Such values strongly affects geophysical parameters retrieval, what in L2 data causes even 50% lack of data.