

NEW DETERMINED THERMAL CONDUCTIVITIES OF SOME TOPSOILS USING IMPROVED BLOCK METHOD

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ABSTRACT

Knowledge of the thermal conductivities of the topsoil layer is of great importance in studying energy and mass exchange processes occurring across the soil surface. However their determination In situ is extremely difficult, especially for the top soil layer, due to the non-homogeneity of natural soils caused by changes in their water content, texture and structure. Thermal Conductivities of clay, loam and sand soils were determined using improved Block method with and without the use of Thermal Interface Material (TIM). KD2 Thermal Properties Analyzer was used to take instantaneous measurement of thermal conductivities with and without the use of TIM for validation. The results show increase with the application of TIM which follows the same trend with KD2 results .Thermal conductivity increases from 0.68 W/ mK to 0.85W/mK , for clay, 0.18WmK to 0.34WmK for loam and 0.34W/mK to 0.39W/mK for sand with Block method while 0.66W/mk to 0.84W/mK for clay, 0.17W/mK to 0.30W/mK for loam and 0.28 WmK to 0.33W/mK for KD2 analyzer.