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Process modeling of drainage leakages in the function of precipitation

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Abstract

At the experimental drainage field Varna of Institute of soil science near Šabac on pseudogley soil (as per WBR, 2006 classification, stagnosol), was established drainage experiment with 3 variants of drain: 20m, 25m and 30m. Statistic modeling of conditionality of drain leakages and intensity of precipitation was prepared according to the data of daily sums of precipitation and according to the data of drain leakages collected for the period of experiment 2007-2009. For statistic modeling, in this experiment, three different statistical models were used: MA (Moving Average), AR (Auto Regressive) and ARMA (Auto Regressive Moving Average). MA model was used and observed in two stochastically processes, where conditionally first process intensity of rainfalls is "process effect" and second process, "process cause" is drain discharge. MA module primarily can be used for forecasting of the value of process and for further analysis of soil, planning, dimensioning and functioning of drainage systems. Application of ARMA model is showing the best results for prediction of values of leakage; AR model is slightly giving less reliable results, while MA model is giving lowest reliable results. Every model is showing better results for smaller spacing of drains.

Key words: MA, AR, ARMA model, precipitation, drain leakages.

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