

Seminar Talks of the Crop Science Group

Gunther Krauss

"Divide et Erra!" - Discretisation problems by the example of SlimWater

03.12.2020 - 14:00

Online Seminar

<<https://uni-bonn.zoom.us/j/99181875497>>

Please request the meeting passcode from hahrends[at]uni-bonn.de

Changing the spatial or temporal discretisation of a model can lead to errors if model parameters or algorithms are bound to a specific discretisation.

We analyse some of the algorithms from SlimWater, a simple tipping bucket model for soil water and solutes that subdivides the soil profile in smaller layers and calculates water movement between these layers. The empirical parameter alpha that determines the fraction of mobile water moving from one layer to another is crucial. However its value is not only depending on the soil characteristic, but also on the layer thickness the model uses for calculation. Another crucial parameter is the aliquot by which daily precipitation is subdivided. It introduces an implicit temporal discretisation, by repeating the water percolation routine depending on daily rain.

In order to fix the problems, a method for adjusting alpha is given and a possible change of algorithm is discussed to address the problem of the temporal discretisation induced by the aliquot.

Beyond the specific SlimWater problems we discuss also some general strategies to deal with similar problems.

The road to wisdom? --- Well, it's plain

and simple to express:

Err

and err

and err again

but less

and less

and less.

Piet Heins (1905-1996)