Contribuții la calculul curbelor de infiltrație prin digurile din pământ

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In branch literature, e.g. [2], there are presented the explicitly equations (4) and (6) for infiltration curves trough earth massif, in transitory regime, derived in certain simplifying hypotheses. We observed that Pietraru solution (6), for $m \geq 0$ but $h=0$ isn't in concordance with classical Barenblatt solution (5). From this reason, our research team had proposed to derive a new solution for infiltration curves. So we obtained the distinct equation (14), that for $m \geq 0$ and $h=0$ simplified exactly to classical solution (5). On purpose to comparatively analysis of our solution (14) versus Pietraru solution (6), using a original MATLAB computer programme, with a numerically value set for constructive and functionally parameters of a dyke, we achieved the graphically representation for two infiltration curve families (fig. 1), each family having the time t, t = {1 d, 3 d, 5 d, 7 d} as parameter. We observed that these curve families there are approximated by four parallel straight lines, and that, in absolute value, the slope for our solution is bigger than the slope for Pietraru solution. Then, with the same numerically value set as above, but for only t=7 d, using computer package FEFLOW 5.1 we obtained the velocity and humidity fields in the transversal section of dyke domain. In the humidity field, the saturation isoline $Sw=0,995 \approx 1,0$ divides the analysis domain in two distinct parts: the upper-unsaturated and the under- saturated. Same we can adopt the saturation isoline Sw=0,995 as the infiltration curve for t=7 d; so any can observe that this curve is suchlike with only straight line assigned with parameter value t=7 d from the solution (14) curve family. In conclusion, our own mathematical model for infiltration curves in transient regime (14) is better than Pietraru solution (6) and this model can be used in practically applications.