

# Ten years' experience in development of numerical models for simulation of surface irrigation/fertigation systems

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## ABSTRACT

The movement of water and solutes in a coupled overland-subsurface system is of high importance in the agricultural studies. In the real-world, a variety of mechanisms interfere the dynamics of surface irrigation systems, requiring complicated and mostly nonlinear/stiff differential equations to be solved. Additionally, to obtain a clear perspective of physical and biochemical state of the growing media, other mechanisms such as root water and nutrient uptake as well as evapotranspiration should be taken into account that implies the presence of crop in the simulated domain. Due to the shortage of water, several models have been proposed by researchers to simulate the above-mentioned process. However, they still lack number of indispensable capabilities. The presented article proposes the surface irrigation models developed in about ten years by the department of water science and engineering, faculty of agriculture, Ferdowsi University of Mashhad (FUM) that tried to address all of the above-mentioned deficiencies of available models in the literature.

**Keywords:** Numerical Model, Surface Irrigation, Computational Fluid Dynamics (CFD)