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Modelling the interactions between irrigation and surface water quantity

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Finding means to enhance water use efficiency is a priority in today's agriculture, especially where surface irrigation methods of irrigation are used. This is the case of the Piemonte region of Italy, where many middle-age canals are still used. However, they often play a positive role in providing water to the subsurface and, in turn to other downstream surface waters.

In this work data are presented regarding irrigation experiments performed in the plain around Torino, Italy, during the summer 2005. This area experienced the great drought of the summer 2003. A model developed by the author (Manzini and Ferraris, 2004) will be used for extending the results to the whole area, also using the new soil map. The unstructured vertical 2D grids allow to model the geometry of along canals sites, which are fundamental for quantifying the water exchanges between the surface and the subsurface water. The model requires daily minimum and maximum daily temperature and hourly rainfall data.

Reference

G.Manzini and S.Ferraris, 2004. Mass conservative finite volume methods on 2-D unstructured grids for the Richards' equation, Advances in Water Resources 27, 1199-1215.