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Discussions

Interactive comment on "Estimating annual effective infiltration coefficient and groundwater recharge for karst aquifers of the southern Apennines" *by* V. Allocca et al.

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We appreciate the general and specific comments given constructively by the Anonymous Referee #2, which will allow us to improve the manuscript by resolving a series of potential misunderstandings. Among the explanations to be added within the text, we recognize the opportunity to give a more precise definition of groundwater recharge by distinguishing it from other infiltration processes. In accordance to comments of the Anonymous Referee #2, we consider to be appropriate the change of the denomination of some hydrological parameters. This change will avoid misunderstandings and clarify the meaning and the scope of our research. In such a view, we also agree

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the suggestion of a change of the title by focusing its meaning more clearly on the groundwater recharge process than on the infiltration one. This change will allow us to deepen and explain differences existing between our coefficient and that proposed by Drogue (1971) and Bonacci (2001). In fact, the already known Effective Infiltration Coefficient, proposed by the cited Authors, is based on the ratio between spring discharge and precipitation, with calculations effected over the whole recharge area of a single karst aquifer and at the monthly and/or annual time scales. Thus, the coefficient was conceived to incorporate the evapotranspiration as a constant for a single karst aquifer. Differently, we consider this approach not applicable at the scale of southern Apennines owing to variability of annual evapotranspiration, which is controlled by the different mean annual precipitation and air temperature. This can be clearly demonstrated by the spatial distribution of the ratio (P-ETR)/P, whose mean values varies between 0.35 and 0.80 for the 40 karst aquifers identified in the southern Italy. To clarify the application of the hydrological budget equation, we intend to rewrite it in a form more appropriate for the calculation of the proposed coefficient. Moreover, we accept to detail the criteria and data used to apply the Darcy's equation to the groundwater outflow calculations toward or outward the sample karst aquifers. Finally, more detailed evaluations of the useful suggestions made by the Anonymous Referee #2 will be carried out in the document accompanying the revised version of the manuscript.

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