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Expression of Interest

Contact Person/Scientist in Charge

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Universitat Politècnica de València (UPV)

Department / Institute / Centre

- **Name:** Institute for Water and Environmental Engineering. Polytechnic University of Valencia (UPV)
- **Address:** Campus de Vera; Camino de Vera, s/n; Valencia (46022)
- **Province:** Valencia

Research Area

- Environmental Sciences and Geology (ENV)

Brief description of the institution:

Universitat Politècnica de València (UPV) is the single Spanish Technical University that features in the main University world rankings. It is within the top 5 Spanish Universities with the highest revenue from both public research and knowledge transfer activities, and a national leader in patent license income and start up creation. Constituted in 1971, it comprises nearly 30.000 students, over 2500 academics, and 17 university research centres of excellence.

UPV has a relevant experience in the participation in international research programmes, with over 100 FP7 projects and 60 H2020 projects in the period 2014-2016. UPV researchers are also actively involved in all H2020 life program stages, from workprogramme drafting discussions, to project coordination. It is also taking part in several major partnering initiatives (JTIs, PPPs, KICs...).

Brief description of the Centre/Research Group (including URL if applicable):

The group of Hydrogeology is specialized in the characterization of the subsurface, specifically in stochastic hydrogeology and inverse modeling. It has developed several innovative algorithms for the analysis of heterogeneous conductivity fields ranging from random field generators such ISIM3D, to complex inverse modeling filters such as the normal-score ensemble Kalman filter.

http://jgomez.webs.upv.es/?page_id=56

Project description:

Who is the culprit?

Maybe we'll never know who is the culprit, but we could know where and when the spill that contaminated the aquifer occurred. Taking this premise as the starting point, we address the problem of determining the source location and its release history in a given aquifer from the concentration breakthrough curves observed at a number of control points. This problem has already been addressed in the literature, but the existing solutions require assumptions that are too restrictive and difficult to justify in a real aquifer. In this project we pretend to develop a new stochastic inverse method for the simultaneous identification of the spatial variability of conductivities together with the location and release function of a contaminant spill from local measurements, in space and time, of piezometric head and solute concentration. This method must not be limited by hypotheses of Gaussianity, or small variability of the parameters. For this purpose, we will make use of the latest developments in the ensemble Kalman filter, obtained in a previous project from the Spanish National R+D Plan, adapting them to incorporate concentrations as a new state variable, and the source location and release history as parameters to identify.

Applications

CV, letter of motivation.