Global sensitivity analysis for models described by stochastic differential equations.

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Abstract: Many mathematical models involve input parameters, which are not precisely known. Global sensitivity analysis aims to identify the parameters whose uncertainty has the largest impact on the variability of a quantity of interest. One of the statistical tools used to quantify the influence of each input variable on the quantity of interest are the Sobol' sensitivity indices. In this paper, we consider stochastic models described by stochastic differential equations (SDE). We focus the study on mean quantities, defined as the expectation with respect to the Wiener measure of a quantity of interest related to the solution of the SDE itself. Our approach is based on a Feynman-Kac representation of the quantity of interest, from which we get a parametrized partial differential equation (PDE) representation of our initial problem. We then handle the uncertainty on

the parametrized PDE using polynomial chaos expansion and a stochastic Galerkin projection.

Talk will be in French.