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Seminaires du LPTM , Universite de Cergy Pontoise

Lundi 2 Décembre 2019, 14 :00
LPTM, 4.13 St Martin II
Domaines : math-ph

Titre : *Efficient Polynomial Chaos Expansion for Uncertainty Quantification in Power Systems*

Orateur : **David Metivier (Los Alamos National Laboratory, CNLS & T-4, New Mexico, USA)**

Résumé : *Growing uncertainty from renewable energy integration and distributed energy resources motivate the need for advanced tools to quantify the effect of uncertainty and assess the risks it poses to secure system operation. In general, Uncertainty Quantification (UQ) methods are used in complex systems research to give probabilistic guarantees.*

I will introduce the context of this work, as well as the Polynomial chaos expansion (PCE) method that has been recently proposed as a tool for UQ in Power Systems. The method produces results that are highly accurate, but are computationally challenging to scale to large systems. We propose a modified algorithm based on PCE and using the system sparsity with significantly improved computational efficiency while retaining the desired high level of accuracy. In an example, we show how to solve the so called chance constrained power flow problem, e.g. we need a solution such that the power transmitted trough the lines should be lower than some safe value 99 percent of the time.