SEMPARIS – Séminaires en région parisienne

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Seminaires du LPTM , Universite de Cergy Pontoise

Jeudi 20 Fevrier 2020, 14 :00
LPTM, 4.13 St Martin II
Domaines : math-ph

Titre : *Black-out transition in Power Grids induced by dynamical vulnerabilities*

Orateur : **David Angulo Garcia (IMA Universidad de Cartagena, Colombia)**

Résumé : *In this work we make use of the well-known Kuramoto model with inertia to study the resilience of power grids to critical failures, using the case of study of the Colombian Power Grid. With the aim of evaluating the resilience of such a network, we use a percolation inspired indicator namely, the transition to black-out induced by targeted failures, based on transmission line and nodal dynamical vulnerability criteria. The targeted removal of both nodes and lines in the network produces a rapid percolation transition mainly due to the low degree distribution of the network, however total black-out transition is found at much larger removal fraction of nodes/links thanks to the ability of the disconnected sub-clusters to synchronize their dynamics within them. Finally, we show that the dynamical vulnerabilities are closely related with topological features of the network and we propose a control technique aimed to cure these vulnerabilities*