

30 November 2021, 15h30-17h30
Amphi Atrium, ESPRIT Building, Campus “Cité Scientifique”, University of Lille

“Sustainable Power Grids: Expansion Planning Point of View to host Renewable Energy Generators”

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Abstract:

To decarbonize energy systems, large and direct connected synchronous generators are more and more replaced by numerous small and variable renewable energy based generators in electrical networks. As these generation technologies are connected to the grid with power electronic converters, the dynamic benefit of inertia in power and energy provision is progressively disappearing in the technical management in power systems. In this talk Hêmin will discuss the problem of sustainable power grids planning from two point of views, namely realization and flexibility.

1) Realization point of view: Inertia adequacy has recently emerged as a new research area to realize sustainable power grid. To tackle inertia adequacy into the Generation Expansion Planning (GEP) problem, minimum permissible inertia that satisfies dynamic standards is defined as inertia adequacy constraint in the GEP formulation. Methods to characterize and define it will be exposed.

2) Flexibility point of view: The need for fast flexibilities to better manage intermittency of variable generations in the sustainable power grid will be discussed. To appropriately handle the intermittency of the DGs, the problem of optimal placement of virtual inertia, emulated by battery energy storage systems (BESSs) is discussed as a techno-economic problem from a stability point of view.

About the Speaker



H Hêmin Golpîra was born in Sanandaj, Kurdistan, Iran by 9-March-1986. Hêmin received the B.Sc., M.Sc., and Ph.D. degrees in electrical engineering in 2007, 2009, and 2015, respectively, all with honors. During 2015 and 2016 Hêmin was with the University of Wisconsin-Madison USA, as associate fellow. In late of 2016, Hêmin joined the University of Kurdistan, Sanandaj, Iran, as assistant professor. During summer of 2019 Hêmin was also invited professor at Ecole Centrale de Lille, France and also in 2021.

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Hêmin has published 24 journal papers, including 6 papers in *IEEE Transactions on Power Systems* and about 25 papers in international conferences. Hêmin is also the author of a book published in 2021 by *Wiley-IEEE*. Hêmin has participated in several international research funded projects and currently he manages an international project, with collaboration of University of Concordia, Canada and Montatana State University, USA, concerning wide area control of power system. Hêmin also did two projects funded by the *Iran National Science Foundation (INSF)* and one industrial project funded by the *Iran Grid Management Company (IGMC)*. Further, Hêmin was received two national and international awards, including 1- Outstanding young assistant professor award (2017), organized by the Iran National Elite foundation, 2- Third rank award of

applied research in 2016 Khwarizmi Youth Award for “Developing a software package for active distribution network dynamic equivalence.