



SEMIDEFINITE OPTIMIZATION APPROACHES FOR REACTIVE OPTIMAL POWER FLOW PROBLEM

Abstract: The Reactive Optimal Power Flow (ROPF) problem consists in computing an optimal power generation dispatch for an alternating current transmission network that respects power flow equations and operational constraints. Some means of voltage control are modelled in ROPF such as the possible activation of shunts, and these controls are modelled using discrete variables. The ROPF problem is thus a nonconvex mixed integer optimization problem. We present recent research work on ROPF, in collaboration with Hydro-Quebec and RTE, that considers semidefinite optimization approaches for solving ROPF and their integration into a branch-and-bound algorithm. We present results on benchmark instances and we show that this method can frequently attain global optimality. On instances not solved to optimality, we are able to find better solutions than the known rounding algorithms in the literature.

Bio: Miguel F. Anjos holds the Chair of Operational Research at the School of Mathematics, University of Edinburgh, and is Professeur associé at Polytechnique Montreal and a member of the GERAD. His research interests are in the theory and algorithms of mathematical optimization, and its applications in engineering. He is the Founding Academic Director of the Trottier Institute for Energy at Polytechnique Montreal, President of the INFORMS Section on Energy, Natural Resources, and the Environment, and INFORMS Vice-President for International Activities. He is a Fellow of EUROPT and of the Canadian Academy of Engineering.

Lundi / Monday

30 mai 2022, 14h00
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Salle / Room 5441
Pavillon André-Aisenstadt
Université de Montréal

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Responsable / Organizer
Margarida Carvalho