



**POLITECNICO
DI TORINO**



Dipartimento di
Scienze Matematiche
G. L. Lagrange

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**Online
seminar**

Monday **December 14, 2020** at 16:30

Hosted on: [Meet](#)

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Power flow feasibility for DC power grids

Prof. Como introduces the seminar.

Abstract

The problem of power flow feasibility for power grids is a classical problem within the power systems literature. The problem concerns under which conditions there exists an equilibrium (operating point) of a power grid such that power demands at the loads in the grid can be met. Since multiple of such operating points may exist, one is to select an operating point which has "desirable" properties. To illustrate, it is desirable that an operating point is stable, but also that it minimizes the dissipation in the lines. The relationship between operating points described by such properties is a priori not clear.

In this talk we discuss the problem of power flow feasibility for power grids with constant power loads. We focus on DC power grids, and for such power grids we give necessary and sufficient conditions for the power flow feasibility problem. If the problem is feasible, we present an explicit method to compute the unique stable operating point. In addition, we characterize the relationship between the desirable properties of operating points. Furthermore we show how these results extend the existing literature.

Biography

Mark Jeeninga received his MSc degree in Mathematics from the University of Groningen in 2015. He is currently a PhD student at the same university, working towards his PhD degree.

His current research interests include power flow analysis, smart grids, algebraic graph theory and matrix theory.