

Long-term dynamics in inverter-dominated grids

Luis David Pabón Ospina

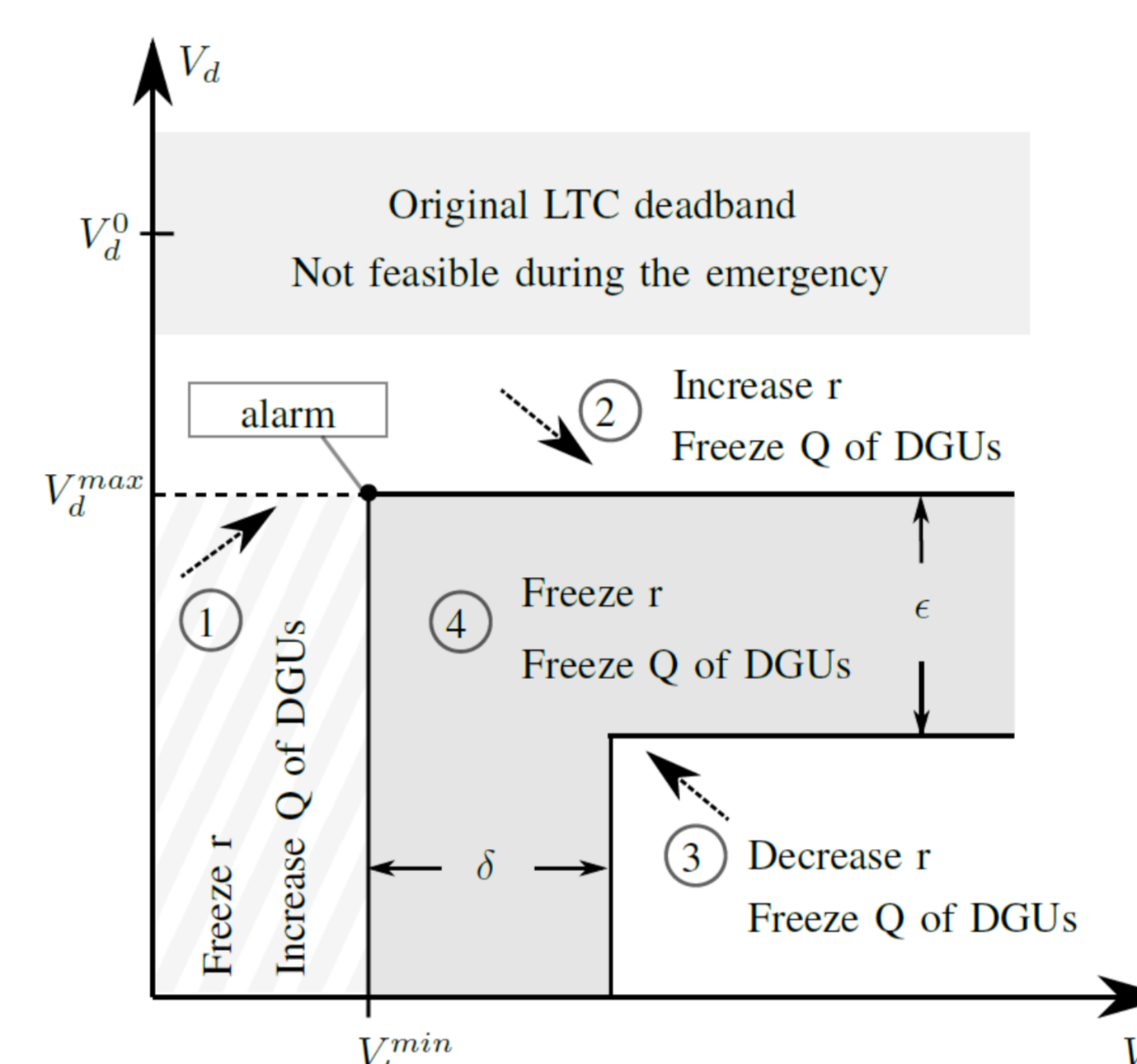
Fraunhofer IEE | Department System Stability and Control | Phone +49 561 7294-249 | luis.david.pabon.ospina@iee.fraunhofer.de

Emergency support of transmission voltages by active distribution networks

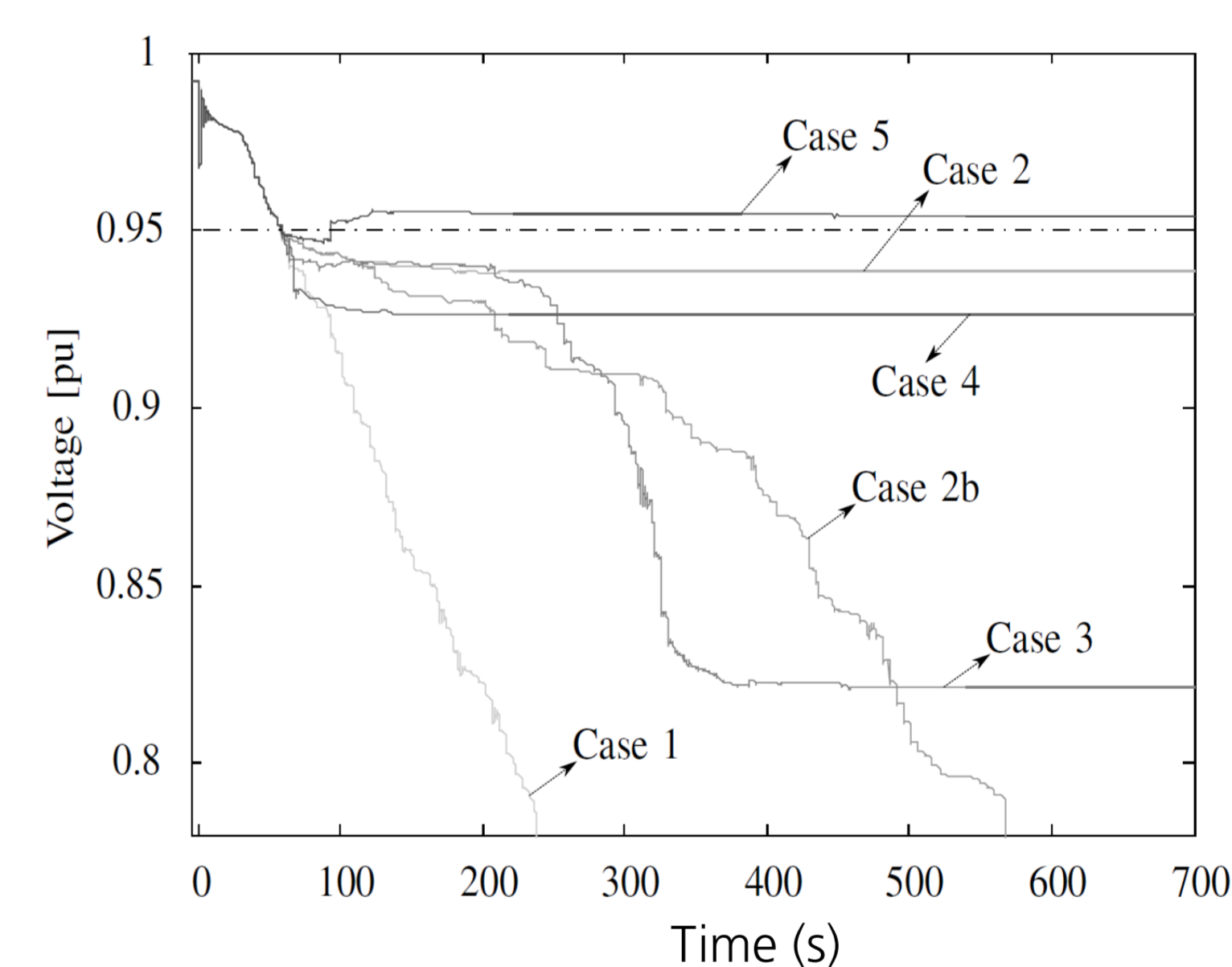
- A novel voltage emergency control against long-term voltage instability was designed.
- It coordinates the control actions of Distributed Generation Units (DGUs) and the LTCs of distribution transformers to support the transmission network in emergency situations.
- The control scheme has been published in the IEEE Transactions on Power Systems¹.
- Patent Pending.
- The control is designed to meet the following characteristics:

1. Non-intrusive. The scheme supports transmission **voltages without affecting the Distribution Network (DN) voltages or overusing its assets**.
2. Adaptive. The control adapts itself to the severity of the disturbance at transmission level, i.e. **less critical situations lead to milder control actions**.
3. Local. The scheme **does not require a dedicated exchange of information** with transmission nor between Active Distribution Networks (ADNs).
4. The number of inputs is small to simplify the implementation. It requires only the distribution voltage V_d and the transmission voltage V_t .
5. The control is **effective regardless of the transmission system characteristics** at the ADN connection point, e.g. short circuit power or voltage sensitivity to reactive power variations.
6. The control is effective regardless of the ADN load characteristics, i.e. type of loads and their dependency to voltage.

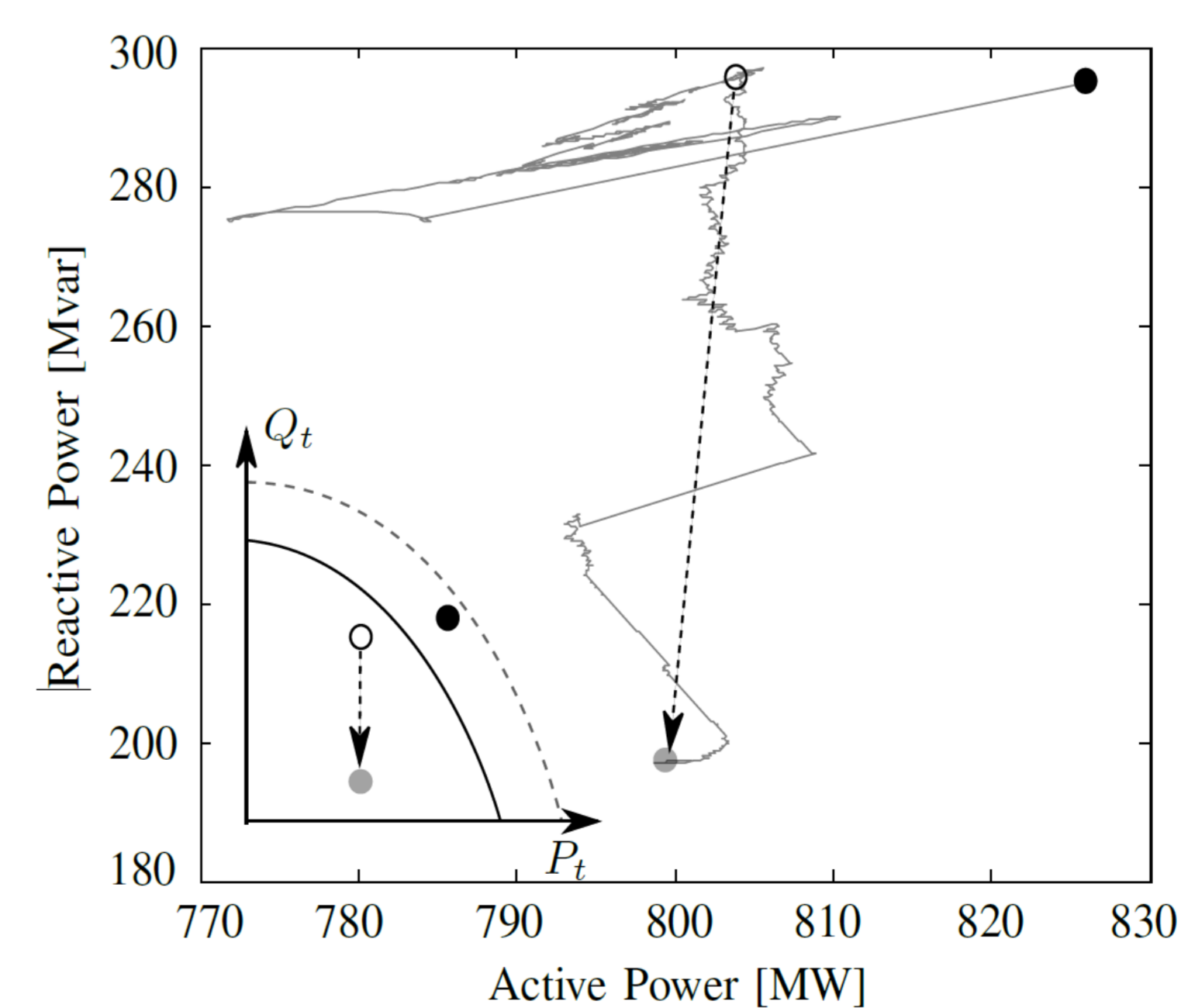
Control logic in the V_d - V_t space



Control performance (Case 5)



Load power space trajectory



¹ L. D. Pabón Ospina and T. Van Cutsem. "Emergency support of transmission voltages by active distribution networks: a non-intrusive scheme". IEEE Transactions on Power Systems.

Gefördert durch:



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