

## **Actividades del grupo de la Universidad de Deusto**

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**Título: Random Batch Method and Model Predictive Control (MPC) for Converted-Dominated Power System Models**

We present an approach that harnesses data-based model order reduction methods to efficiently solve partial differential equations (PDEs) and ordinary differential equations (ODEs) in complex and expansive networks. Large-scale networks, encountered in diverse fields such as physics, engineering, biology, and social sciences, often pose significant computational challenges when simulating their dynamical behavior. Traditional numerical techniques can be prohibitively expensive in terms of computational resources and time. Our methodology leverages the power of data-driven techniques to address these challenges, applying it particularly to Converted-Dominated Power System Models. We use data-based reduced-order models, such as the Random Batch Method and combine it with the Model Predictive Control (MPC) to smooth the solutions. This approach not only reduces the computational complexity but also enhances the accuracy of the simulations.