



IEEE 7th Global Power, Energy and Communication Conference

Bochum/GERMANY

June 11-13, 2025

Special Session on

Real-time and Hardware in the Loop Simulation of Power Systems

This technical session focuses on emerging trends and innovations in real-time simulation and hardware-in-the-loop (HiL) testing for power systems, renewable energy generation, energy storage, and high-voltage direct current (HVDC) transmission. With the increasing penetration of renewable energy sources and the need for resilient and stable power systems, real-time simulation and HiL techniques play a important role in validating software simulation results, optimizing control strategies and ensuring power system stability under various operating conditions.

The session will cover cutting-edge methodologies and applications in real-time digital simulation, power hardware-in-the-loop and controller hardware-in-the-loop. Emphasis will be placed on real-time modeling of renewable generations and HVDC systems. The session will also highlight grid-forming controls and artificial intelligence (AI)-based approaches, which will play important role in future power systems.

Topics of interest include, but are not limited to:

- Development in real-time simulation tools and platforms for power systems.
- Power hardware-in-the-loop and controller hardware-in-the-loop applications.
- Real-time modeling and simulation of renewable generations (wind, PV, hybrid systems).
- Detailed modeling of power electronic converters in real-time simulators.
- AI and machine learning techniques for real-time simulations.
- Cybersecurity and resilience assessment through hardware-in-the-loop simulation.
- Grid-forming and grid-following converter modeling, simulation and validation by means of hardware-in-the-loop.

Organizer(s):

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Deadlines of the special session:

Full paper submission (maximum 6 pages):	March 30, 2025
Notification of acceptance:	April 27, 2025
Final submissions due:	May 11, 2025

All the instructions for paper submission are included at the conference website.
<https://gpecom.org/2025/guidelines/>