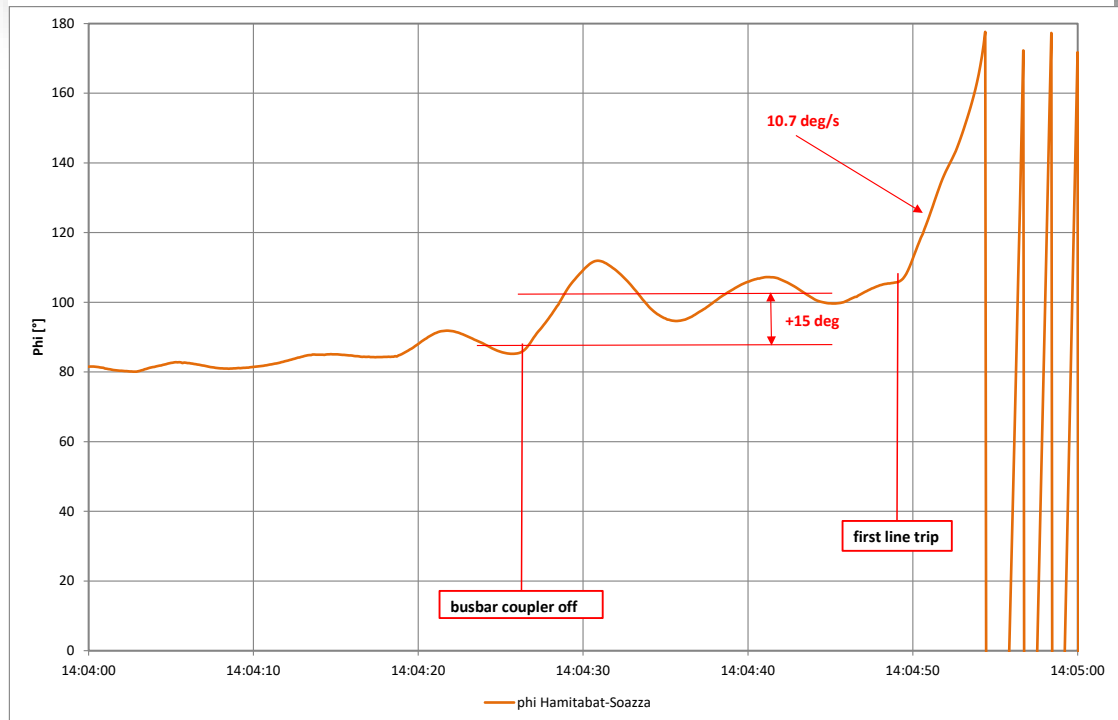
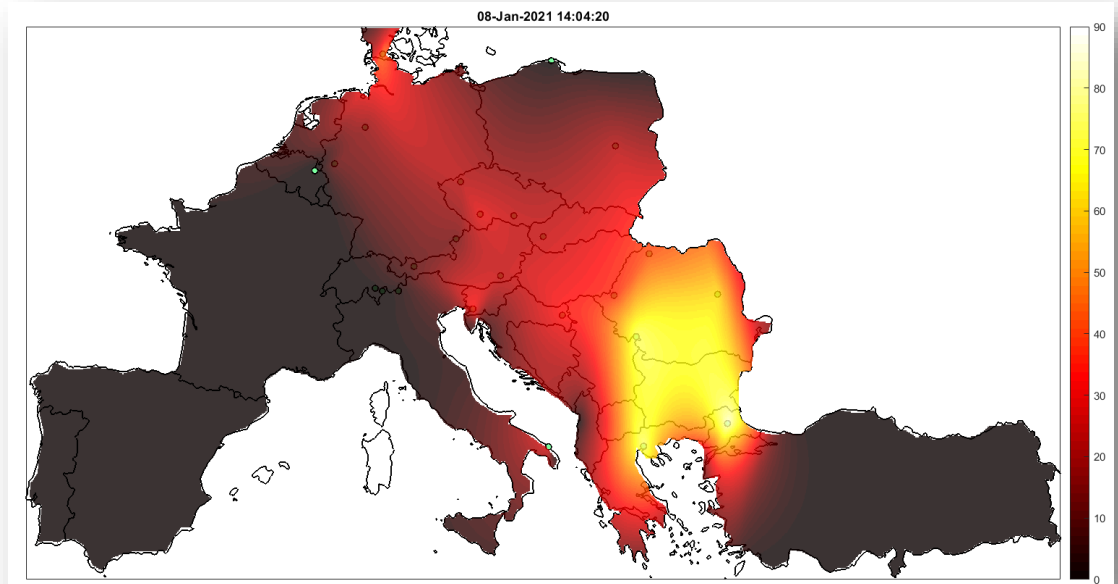
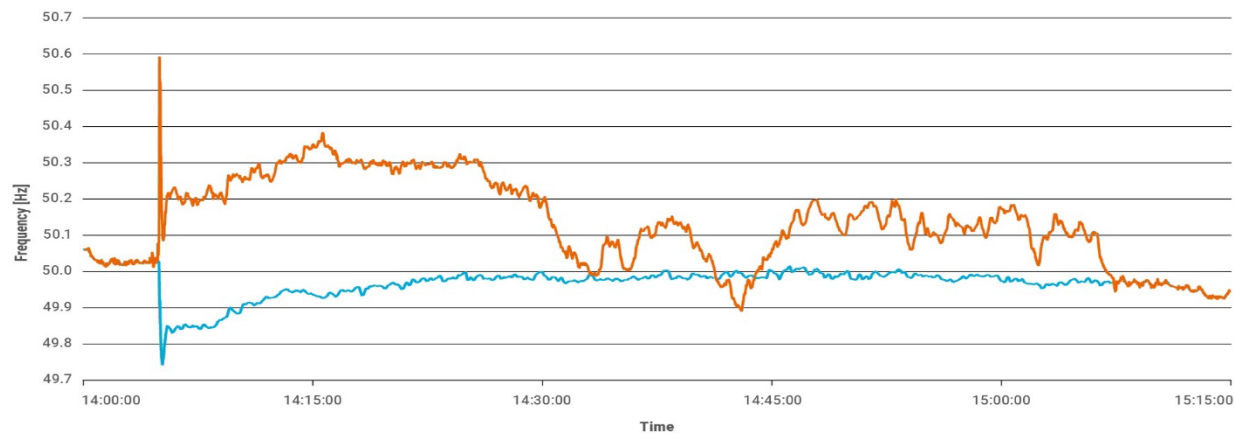
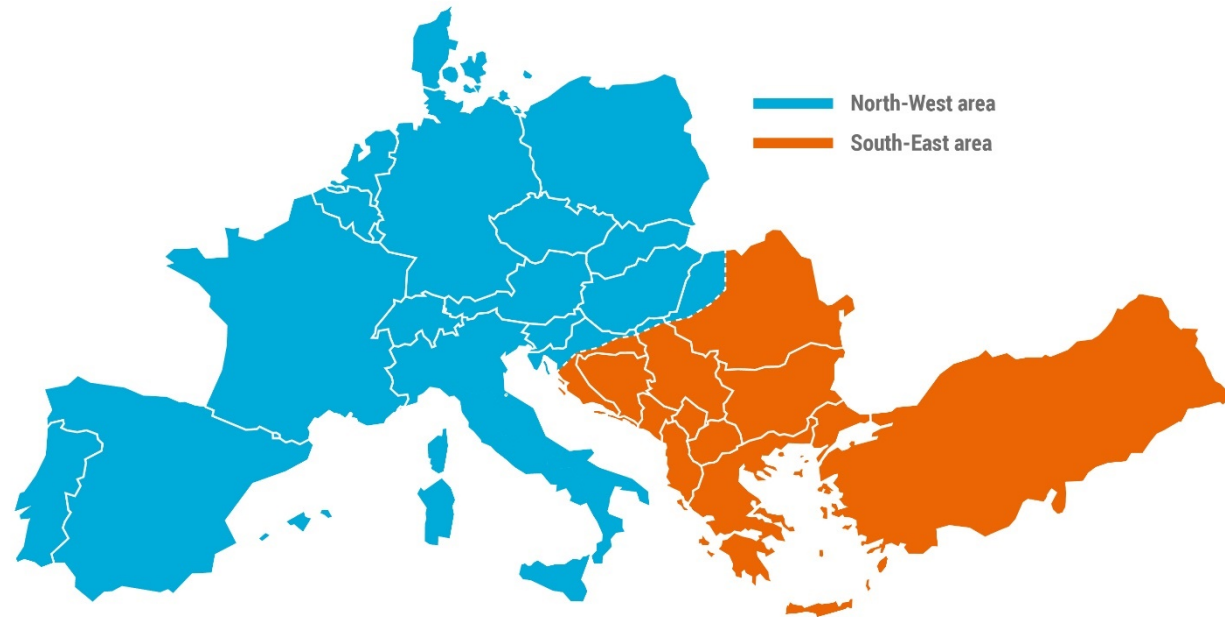


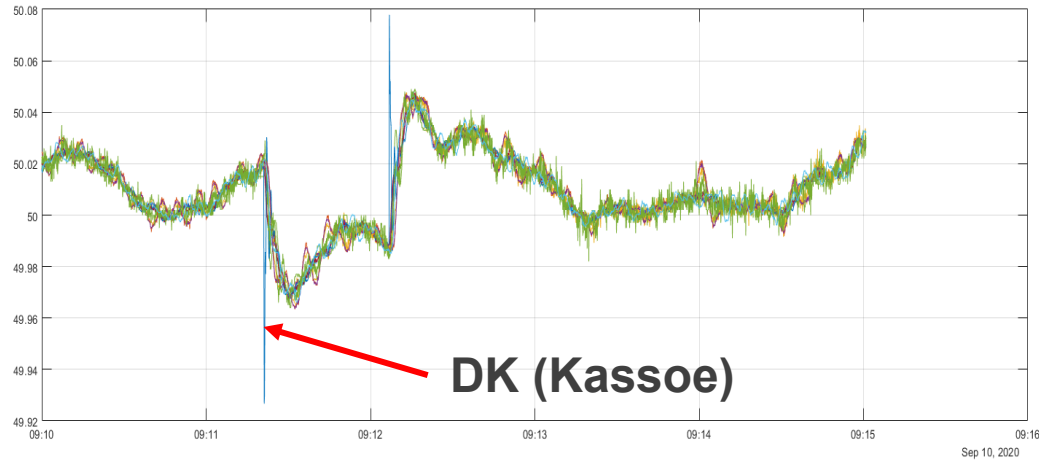
# Use of WAM Tools for the Secure Operation of the Continental European Power System



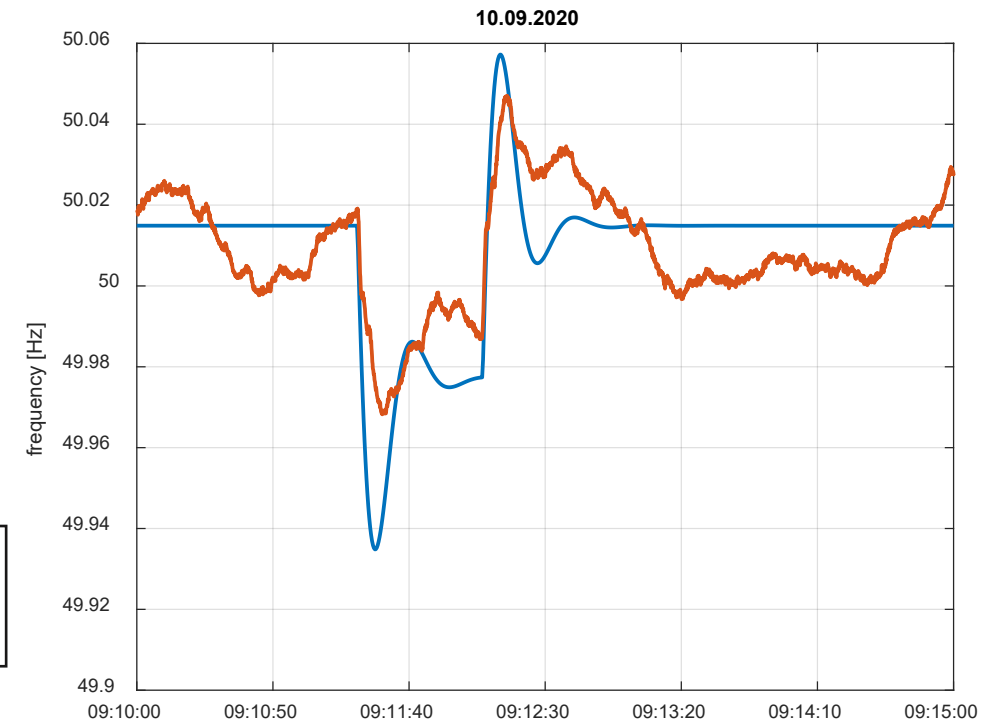
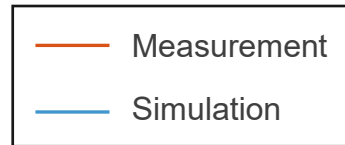
# 1. Role of WAMs for the CE Jan 8<sup>th</sup> 2021 Event Evaluation



## 2. Role of WAMs for the CE Dynamic Model Calibration



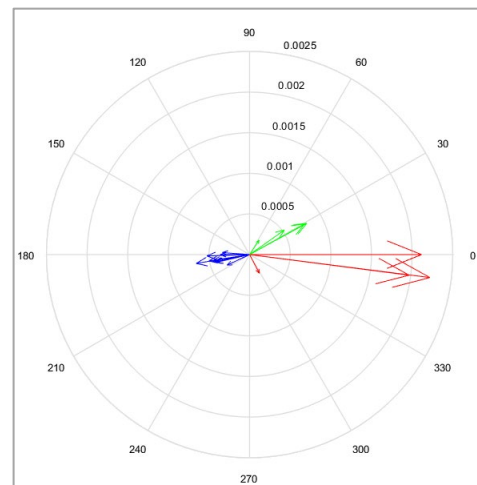
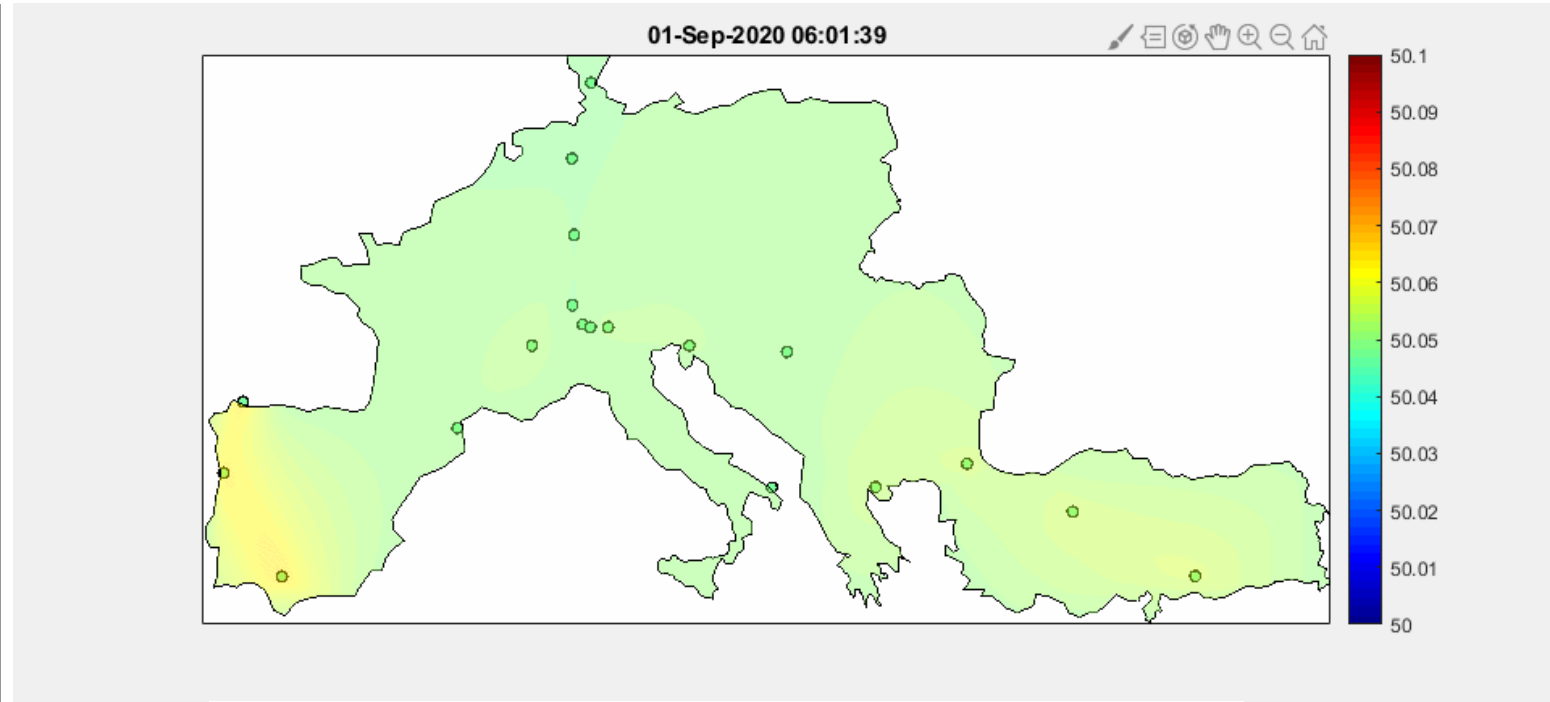
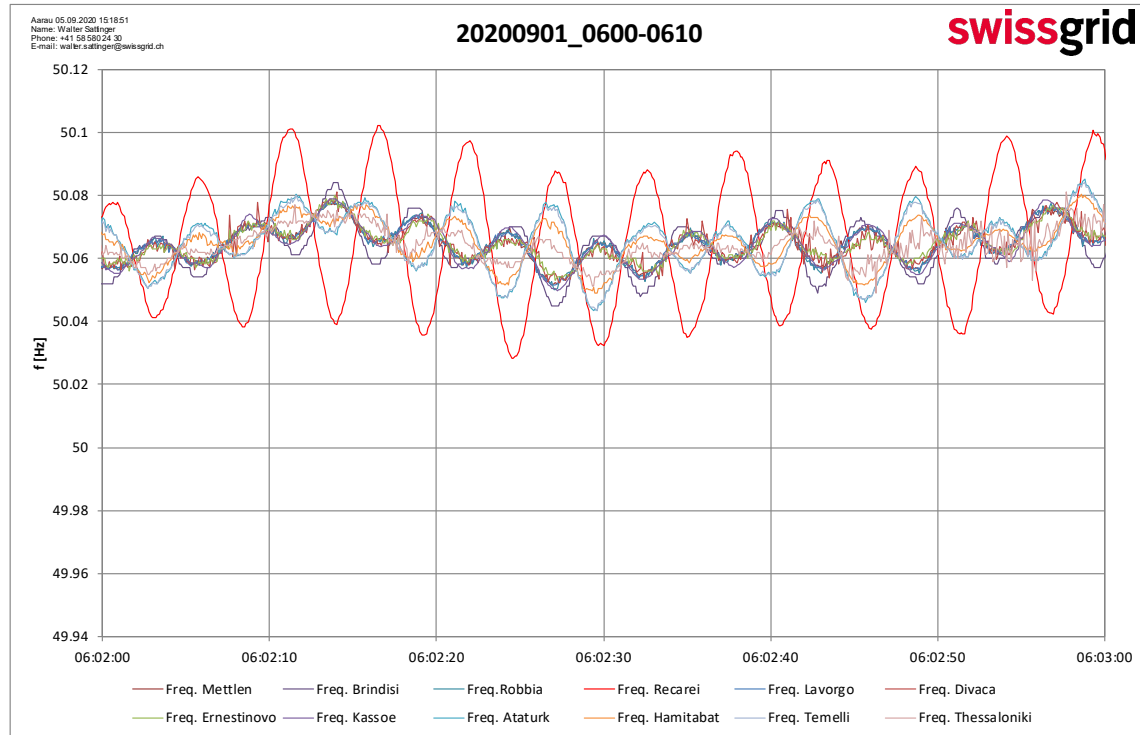
$$RoCoF = \frac{50 \text{ Hz}}{8,1 \text{ s}} \cdot \frac{1400 \text{ MW}}{344000 \text{ MW}} = 25,1 \text{ mHz/s}$$



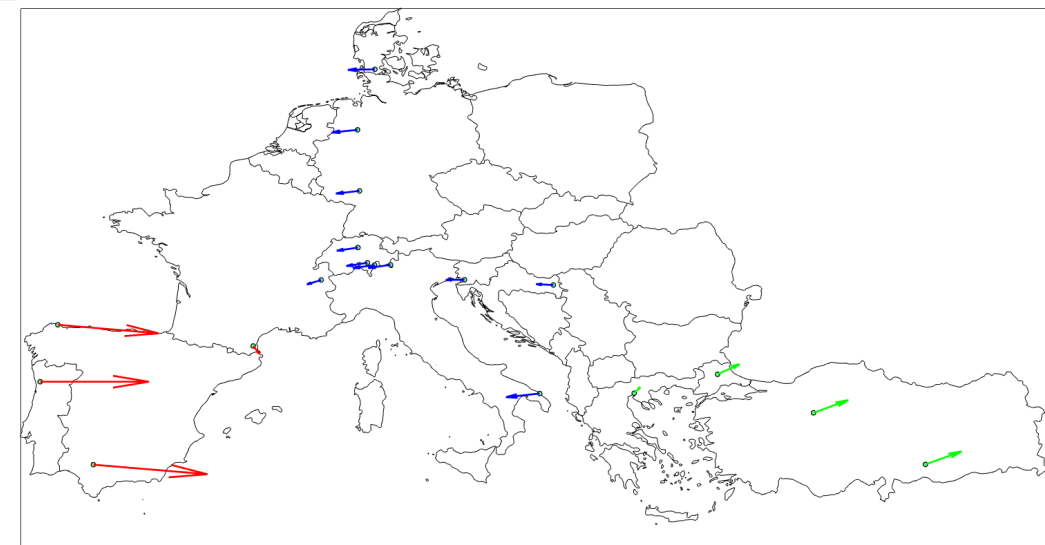
Sept. 10<sup>th</sup> 2020 – Nord-Link failure during commissioning -> 1 minute disconnect/connect 1400 MW between two synchronous areas

# 3. ENTSO-E SPD TF WAMs Tool

Analysis of poorly-damped inter-area oscillations, as one example: Iberian peninsula oscillation. Sept. 1st 2020



- PT-Recarei.f
- ES-Carmona.f
- ES-Xove.f
- CH-Lavorgo.f
- CH-Mettlen.f
- CH-Robbia.f
- CH-Soazza.f
- IT-Brindisi.f
- HR-Ernestinovo.f
- SI-Divaca.f
- DK-Kassoe.f
- DE-Buerstadt.f
- DE-Wehrendorf.f
- TK-Ataturk.f
- TK-Hamitabat.f
- TK-Temelli.f
- GR-Thessaloniki.f
- FR-Baixas.f
- FR-Albertville.f
- FR-Baixas.f



## 4. Next Steps for Further WAMs Usage

- Efforts for standardisation of WAMs results reporting and data acquisition
  - Further developments on CE SPD TF WAMs tool
  - More intensive use of WAMs for dynamic model calibration
- Improve the link between standalone WAMs and CE power system operators SCADA systems
  - CIGRE TB 750, Dec. 2018
  - CIGRE WG C2.18 – work ongoing (2020 – 2022)
  - Expand/extend ENTSO-E EAS-system



# Thank you for your interest

Swissgrid AG  
Bleichemattstrasse 31  
Postfach  
5001 Aarau  
Schweiz