

École Polytechnique Fédérale de Lausanne  
and Bern University of Applied Sciences  
organize in collaboration with  
Société Mont-Soleil

## PhD Summer School Mont-Soleil 12<sup>th</sup> – 16<sup>th</sup>/17<sup>th</sup> August 2019

### Field-Based Insights into the Implementation of Renewable Energies

#### Conference program 12<sup>th</sup> – 16<sup>th</sup> August 2019

- Climate change and the 1.5°C goal of the Paris agreement
- Climate and environmental physics labs at University of Bern
- Mont-Soleil PV plant – layout, long-term measurements, LCA
- PlanetSolar, the first around the world tour with a solar boat
- Design of high efficiency solar cells
- Strategies for hydropower deployment
- Excursion to hydropower plant La Goule at the Doubs river
- JUVENT wind power plant, landscape challenges, plant visit
- Wind turbine design and repowering
- Assessing wind resources in complex terrain
- Multiscale modeling framework for wind power forecasting
- Technological development in the JUVENT windfarm 1996 – 2019 including repowering
- Planning and control of active power networks
- Classical and advanced power electronic solutions for the network integration
- Power quality in distribution grids related to RES and power electronics
- Energy storage with batteries, classical solutions and modern components
- Machine learning solutions to predict battery lifespan and optimize energy consumption
- Energy autonomous concept for cheese making
- Energy storage and efficiency – theory of Ragone representation
- Battery modeling with application to high energy density systems
- Aging phenomena of Li-Ion batteries and life cycle modeling
- Visit to BFH-CSEM Energy Storage Research Centre at Biel/Bienne

#### Post-conference program 16<sup>th</sup>/17<sup>th</sup> August 2019

- Glacier retreat, visit to district heating plant in Grindelwald
- Visit to High Altitude Research Station at Jungfrauoch

**For the detailed program and registration process see**

[www.bfh.ch/de/aktuell/veranstaltungen/summer-school-mont-soleil](http://www.bfh.ch/de/aktuell/veranstaltungen/summer-school-mont-soleil)

or [www.societe-mont-soleil.ch](http://www.societe-mont-soleil.ch)

## Principal lecturers

- École Polytechnique Fédérale de Lausanne EPFL
- Bern University of Applied Sciences BFH
- University of Bern
- Haute École Arc Ingénierie at Saint-Imier
- Private companies

## Language / Credits

English / 2 ECTS

### Provision of multiple ancillary services

	Dispatch + primary frequency regulation (PFR)	PFR
Power Budget	Worst case high and worst case low power deviation from the dispatch plan.	Drop coefficient (unknown, to determine) time worst case frequency deviation (200 mHz).
Energy Budget	Integral of worst case deviations.	5-95% quantiles of the distribution of the accumulated frequency deviation in 1 day over a 2-year period.

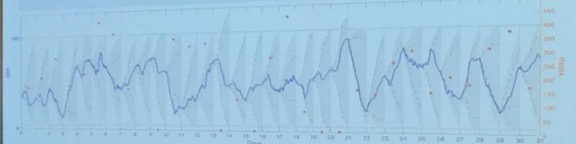


Fig.: Battery's state of energy (SOE): realization (thick blue line), dispatch (dashed black line), worse cases for dispatch + PFR allocated drop coefficient (orange dots).

## Venue

The summer PhD school will be held on Mont-Soleil above the city of Saint-Imier in the Western Part of Switzerland. Production, distribution and application of renewable energies can be shown in a directly perceptible way since all adequate facilities are concentrated on and around Mont-Soleil in a unique manner. Lectures and workshops will take place in the visitor center, with top experts from internationally renowned universities as well as from industries in the field of renewable energies.

Hotel accommodation will be organized in a unique mountain hotel on Mont-Soleil.

## Post-conference program

Presentation of glacier retreat and visit to a renewable district heating plant in Grindelwald.

Visit to the High Altitude Research Station Jungfrauoch (3500 meters above sea level), where in around 50 projects, more than 100 variables are being measured. Along with 30 other observation sites, the High Altitude Research Station is part of the global monitoring network Global Atmosphere Watch (GAW).

