i2Mon

Integrated Mining Impact Monitoring

R&D project supported by RFCS - Research Fund for Coal and Steel
Grant Agreement Contract 800689 - i2Mon - RFCS - 2017

2018 - 2022

DMT

EFTAS

TU Delft

Instytut Mechaniki Górotworu PAN

Hochschule Mainz University of Applied Sciences

TU Bergakademie Freiberg

AIRBUS

LASERDATA

LEAG

Polska Grupa Górnicza

- Webinar User Workshop -

7th December 2021

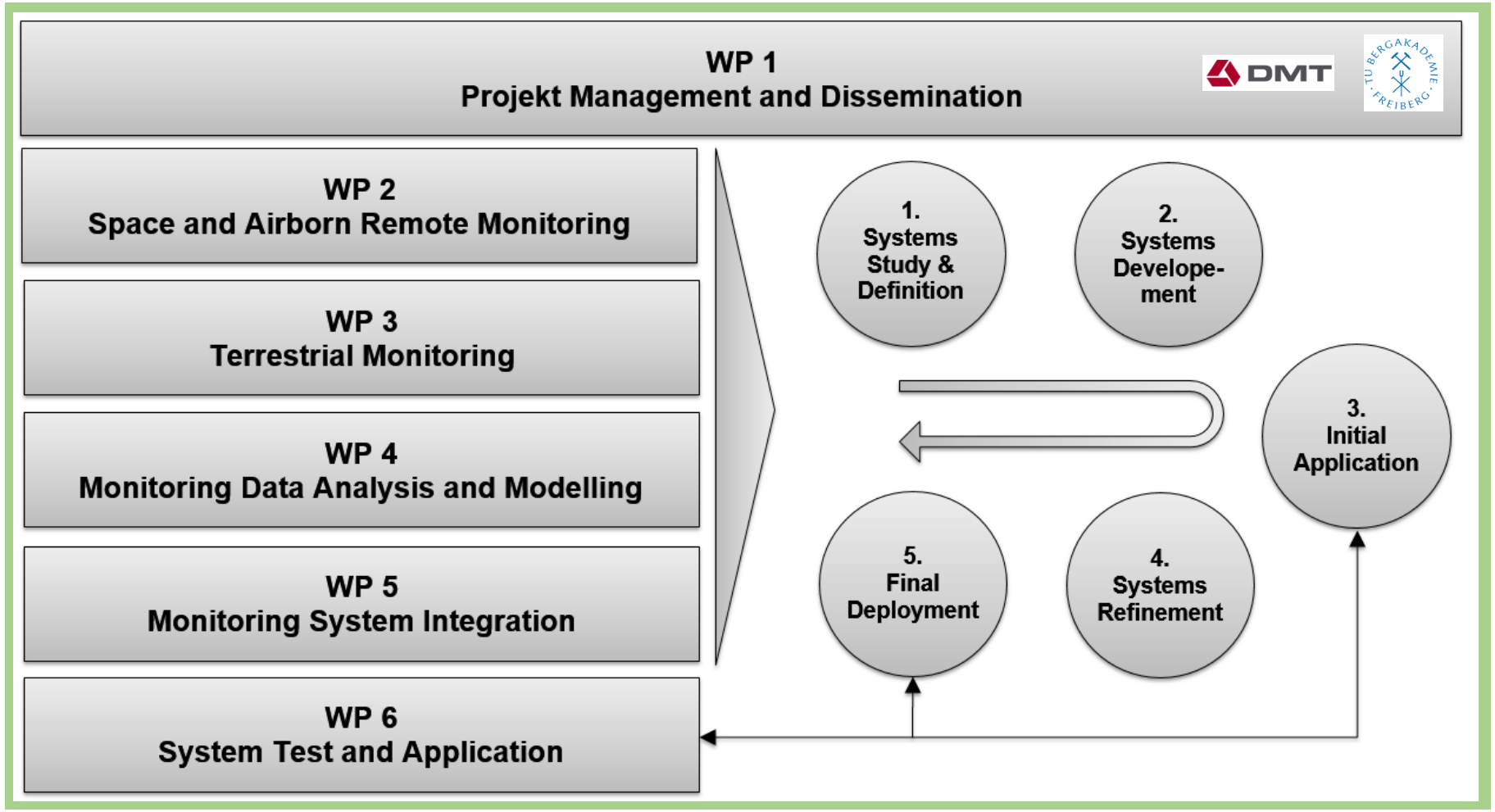
Project - Objectives

- **Development of innovative monitoring tools for enhanced ground and slope deformation monitoring** using advanced terrestrial (low-cost geodetic, geotechnical sensors), laserscanning technology, spaceborne (Sentinel, TerraSAR-X PSI) and airborne (UAV) technology delivering continuous, near real time data acquisition and extensive areal information.

- **Identification of physical processes that affect ground and slope deformations** and development of suitable modelling methods to be implemented in order to make reliable impact predictions. Modelling information is foreseen to be directly integrated with the monitoring information to substantially improve the temporal and spatial information density and result exploitation.

- **Development of the integrated monitoring system**, including data ports, database, analysis and visualization functionalities aiming to substantially reduce the cost of information and enable a quantitative risk assessment of mining impact and precise identification of sites carrying the highest liability.

Project – Work Packages & Development Cycle



Event Agenda

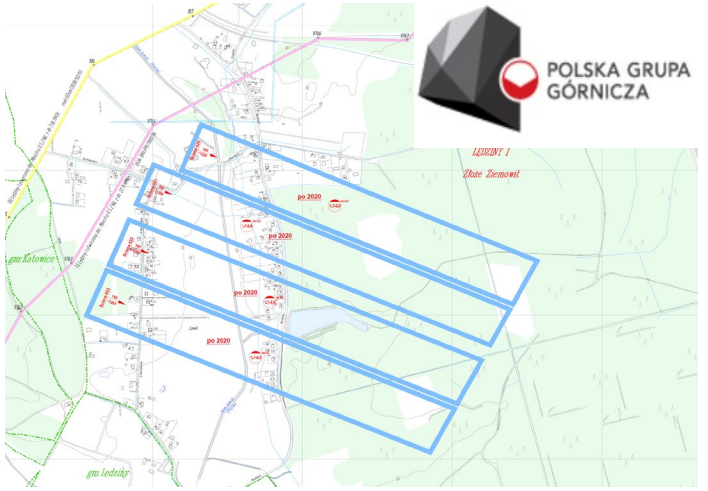
09:00	Welcome & Project Introduction - DMT
09:10	Satellite Radar Remote Sensing - EFTAS & AIRBUS
09:40	UAV Lidar - LASERDATA
10:00	Ground-based Lidar - DMT & MAINZ
10:20	Slope Stability Modelling - TU DELFT
10:40	Ground Subsidence Modelling - IMG PAN
11:00	Sensor Data Platform - DMT

General remarks:

- **Please leave your question or comment in the chat.**
- **You question will be answered after each presentation or at the end of the event.**
- **During the event short survey forms are available for each topic - we appreciate your feedback.**
- **We will make the presentations available for participants after the event.**
- **You will get a participation certificate via email after the event.**
- **Partner & expert contact exchange via: karsten.zimmermann@dmt-group.com**

WP6 - Monitoring System Application

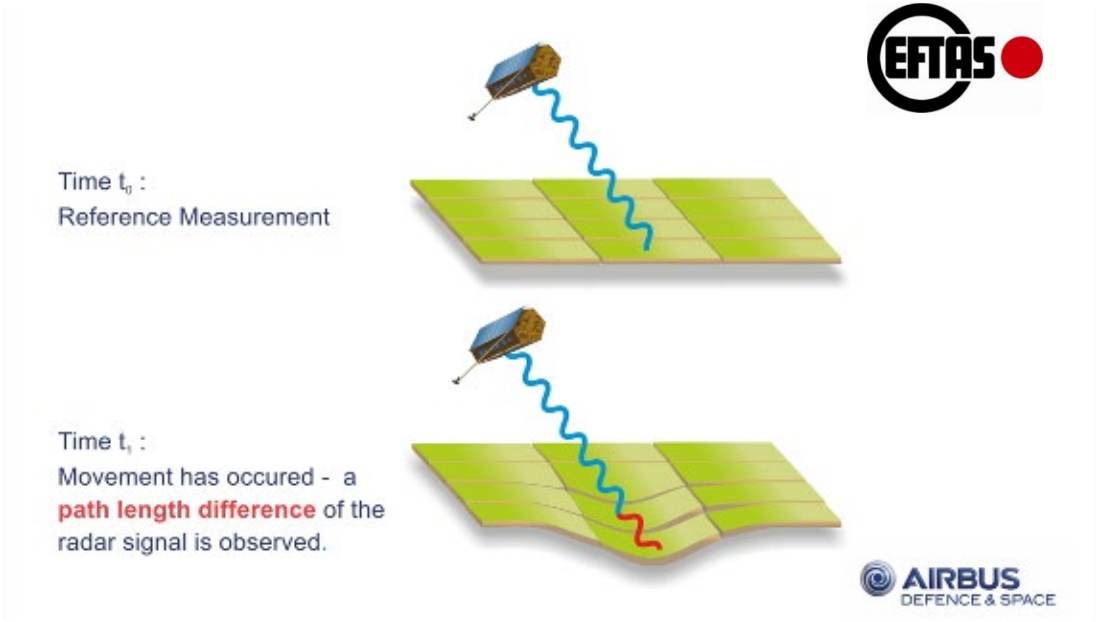
- Two industry test sites in preparation
- Open-pit: LEAG former lignite open pit “Cottbus-Nord”; Underground: PGG active longwall panels

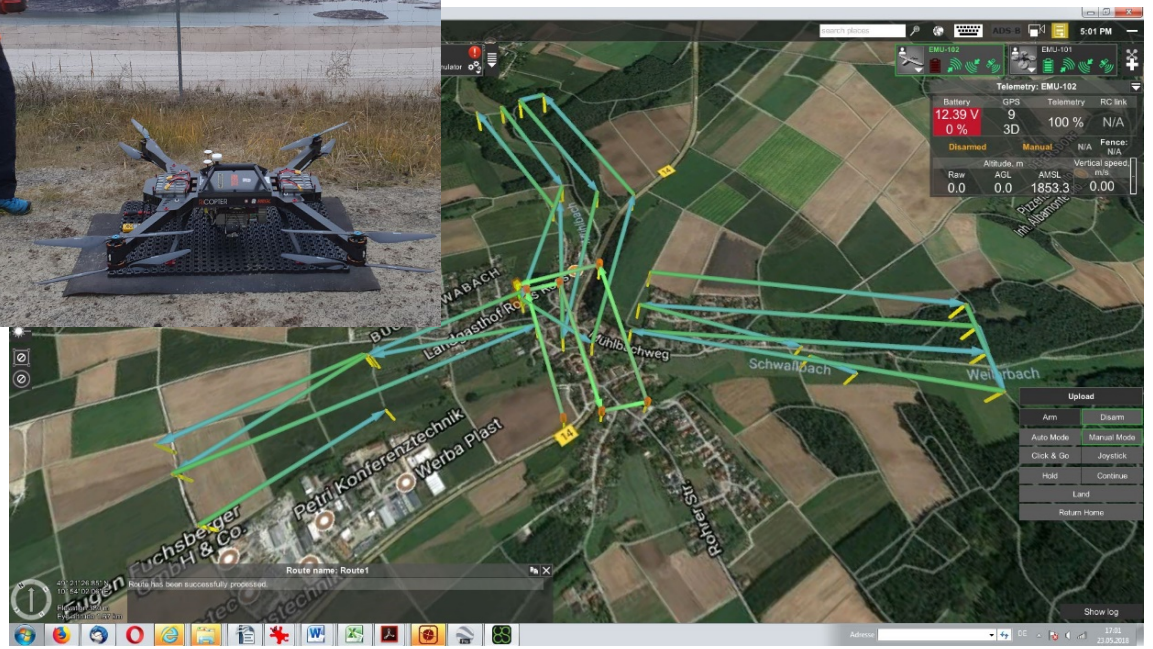


WP2 – Space and Airborne Remote Monitoring

Study and Application of Remote Monitoring Data, Systems and Processing Technology

- Satellite INSAR (Sentinel-1, TerraSAR-X) and UAV laserscanning





WP3 - Terrestrial Monitoring

Study and Application of Terrestrial Monitoring Technology

- Long-Range Laserscanning (Riegl VZ2000i, IoT) and L1-Low-Cost GNSS (IoT)

Process & Software Development

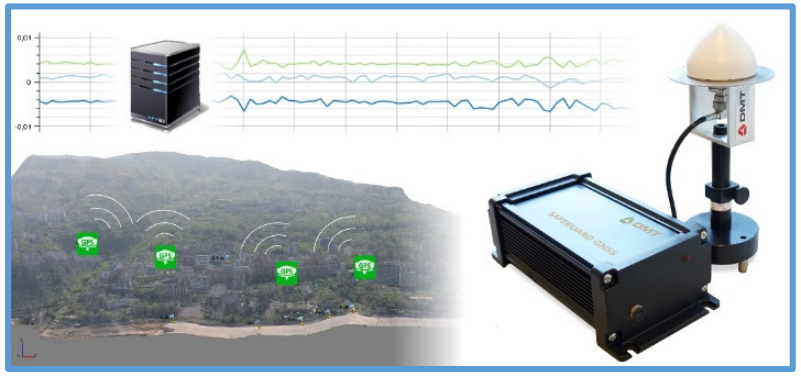
python Programming

TLS / HTTPS

WEBSOCKET

Internet
4G / 5G

Monitoring Platform - WP5



Device Hardware & Software Development

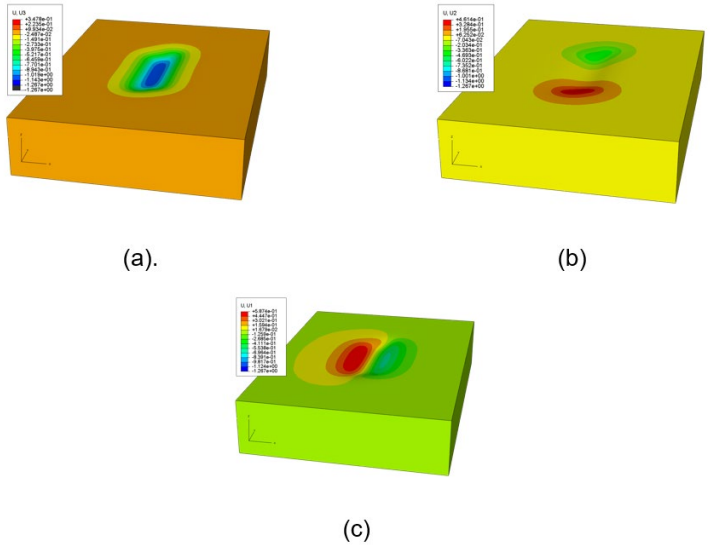
DMT

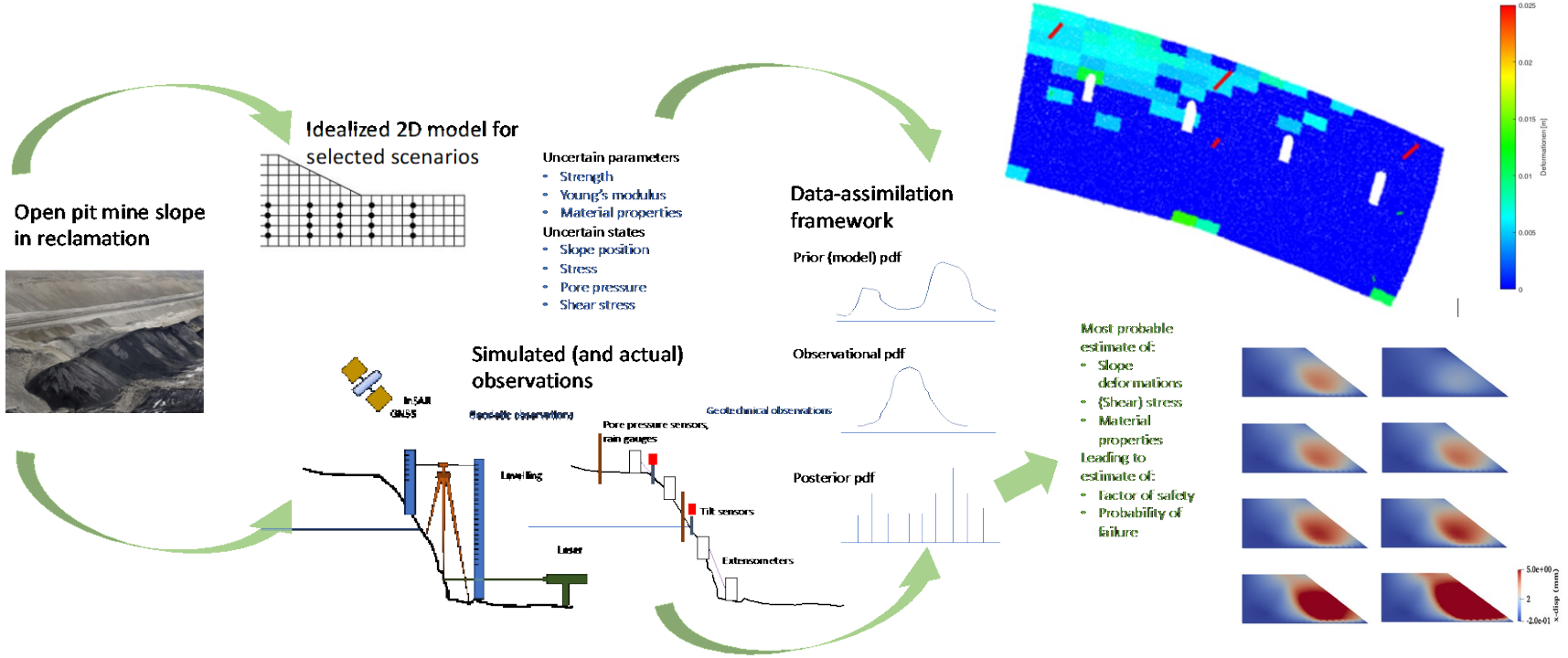
HOCHSCHULE MAINZ
UNIVERSITY OF
APPLIED SCIENCES

WP4 - Monitoring Data Analysis and Modelling

Study and Application of Modelling and Data Analysis Technology

- Subsidence modelling (FEM), point cloud deformation analysis and slope stability modelling (FEM) including data assimilation





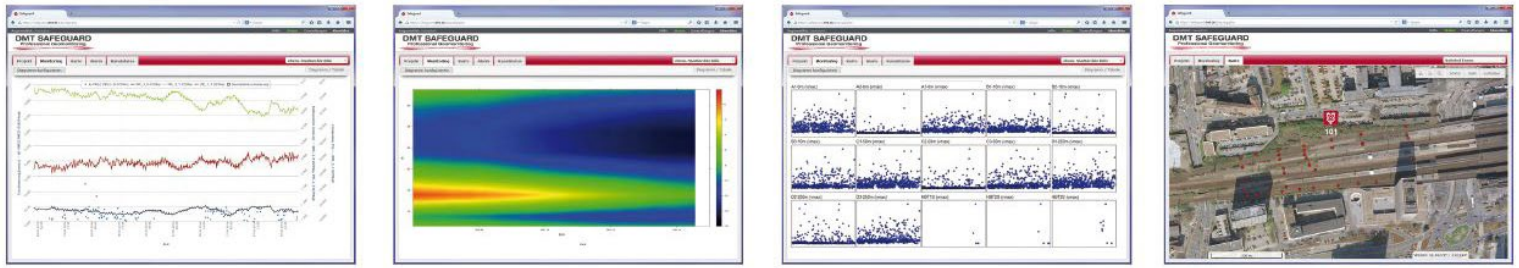
WP5 - Monitoring Platform

Development of an Integrated Monitoring System

- Development of an integrated web-based information system
- Enhancement of the data base to cover new data types and formats
- Enhancement of data visualization incorporating InSAR and laserscanning point clouds
- Project platform with partner and end-user access

Flexible data integration (format, type, manufacturer)

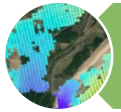
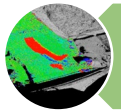
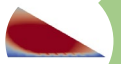
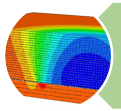
Data storage and management



Online - Visualization

Alarming und Support

Event Agenda

Welcome & Project Introduction - DMT	09:00
 Satellite Radar Remote Sensing - EFTAS & AIRBUS	09:10
 UAV Lidar - LASERDATA	09:40
 Ground-based Lidar - DMT & MAINZ	10:00
 Slope Stability Modelling - TU DELFT	10:20
 Ground Subsidence Modelling - IMG PAN	10:40
 Sensor Data Platform - DMT	11:00

General remarks:

- **Please leave your question or comment in the chat.**
- **You question will be answered after each presentation or at the end of the event.**
- **During the event short survey forms are available for each topic - we appreciate your feedback.**
- **We will make the presentations available for participants after the event.**
- **You will get a participation certificate via email after the event.**
- **Partner & expert contact exchange via: karsten.zimmermann@dmt-group.com**