



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 676139



INFRASTAR Project

BAST Symposium 21st March 2018

Odile ABRAHAM, Ifsttar – Project Coordinator
Hakim FERRIA, Ifsttar – Project Manager
Ernst Niederleithinger, BAM – Work Package 1 leader
Eugen Bruhwiler, EPFL – Work Package 2 leader
John D. Sorensen, AAU – Work Package 3 leader

The project

- **I**nnovation and **N**etworking for **F**atigue and **R**eliability
Analysis of **S**tructure – **T**raining for **A**ssessment of **R**isk
- **H2020 MSCA ITN ETN**
 - **M**arie **S**kłodowska **C**urie **A**ctions
 - **I**nnovative **T**raining **N**etworks
 - **E**uropean **T**raining **N**etworks
- 01 May 2016 - 30 April 2020
- Budget: 3 161 113 €

12 Early Stage Researchers (ESRs)



ESR9 Amol Mankar (Aalborg Universitet, India)

ESR11 Sima Rastayesh (Aalborg Universitet, Iran)

ESR8 Joey Velarde (COWI, Philippines)

ESR1 Xin Wang (BAM, China)

ESR12 Lijia Long (BAM, China)

ESR7 Gianluca Zorzi (CONSULT, Italy)

ESR3 Joyraj Chakraborty (NeoStrain, Bangladesh)

ESR5 Bartłomiej Sawicki (EPFL, Poland)

ESR4 Imane Bayane (EPFL, Morocco)

ESR10 Morteza AhmadiVala (Iran)

ESR2 Antoine Bassil (IFSTTAR, Lebanon)

ESR6 Maria Nesterova (IFSTTAR, Russia)

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Objectives

- Develop knowledge, expertise and skill for optimal and reliable management of structures.



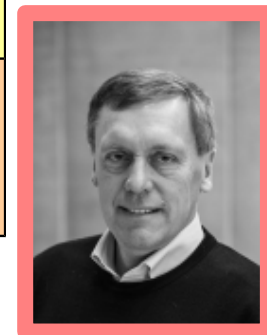
Fatigue of concrete



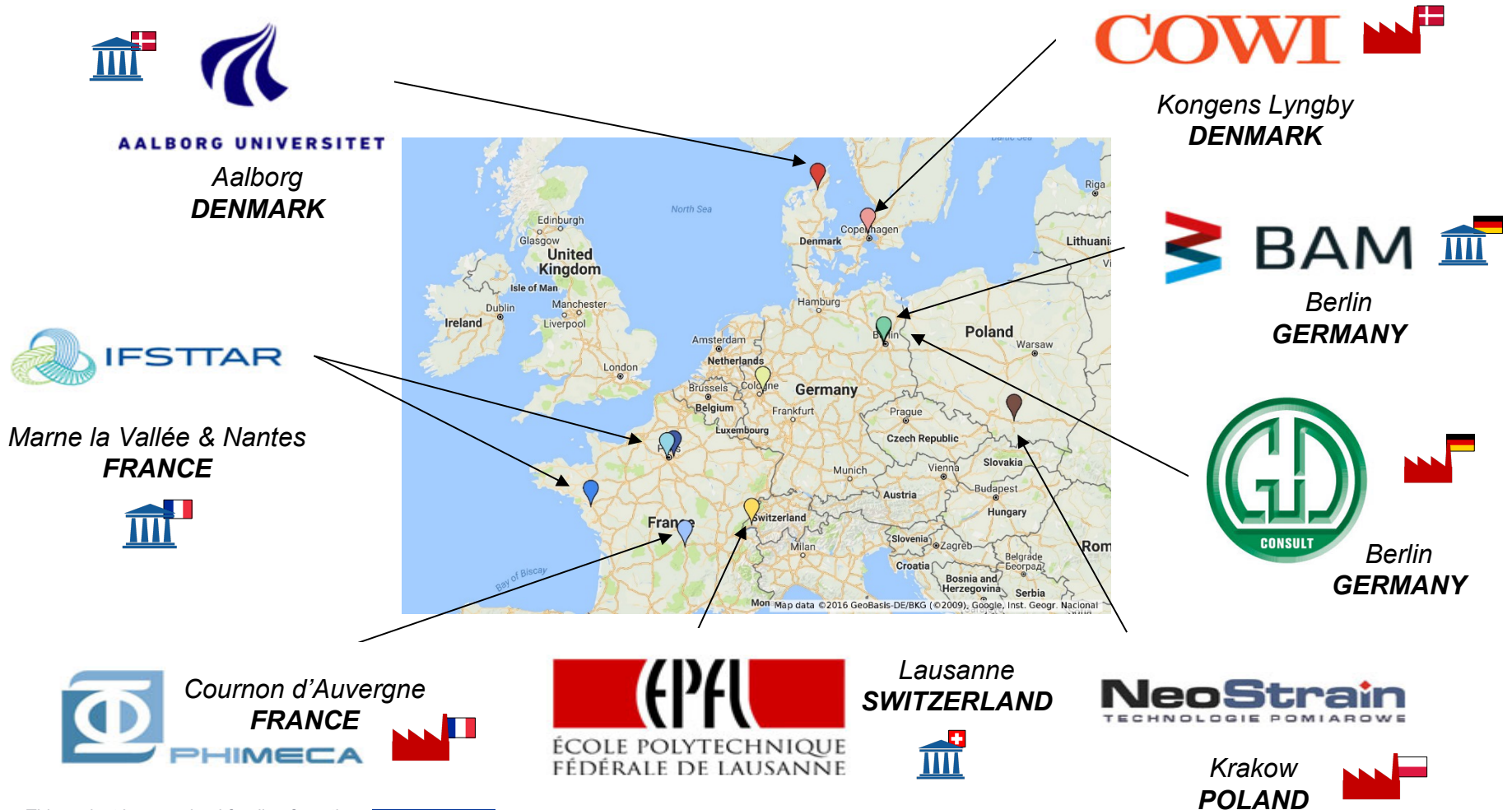
- 3 major challenges
 - Advanced modelling of concrete fatigue behaviour.
 - New NDT methods for early aged damage detection.
 - Probabilistic approach of structure reliability under fatigue.

Work Packages

WP1	<p>Monitoring and auscultation</p> <p><i>Leader: Ernst Niederleithinger (BAM)</i></p>
WP2	<p>Structural and action models</p> <p><i>Leader: Eugen Brühwiler (EPFL)</i></p>
WP3	<p>Reliability approaches for decision making</p> <p><i>Leader: John Dalsgaard Sørensen (Aalborg University)</i></p>
WP4	<p>Recruitment and training policy</p>
WP5	<p>Management, dissemination, outreach and business opportunities</p>



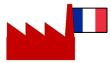
The beneficiaries



The partner organisations



Vélizy-Villacoublay
FRANCE



Bergisch Gladbach
GERMANY



VALEMO
exploitation & maintenance ENR

Nantes, Bègles
FRANCE



The advisory board

Prof. Marios Chryssanthopoulos



Prof. Jan Bien



Politechnika
Wroclawska



Prof. Ton Vrouwenvelder



Morten Sogaard Andersen



Pascal Collet

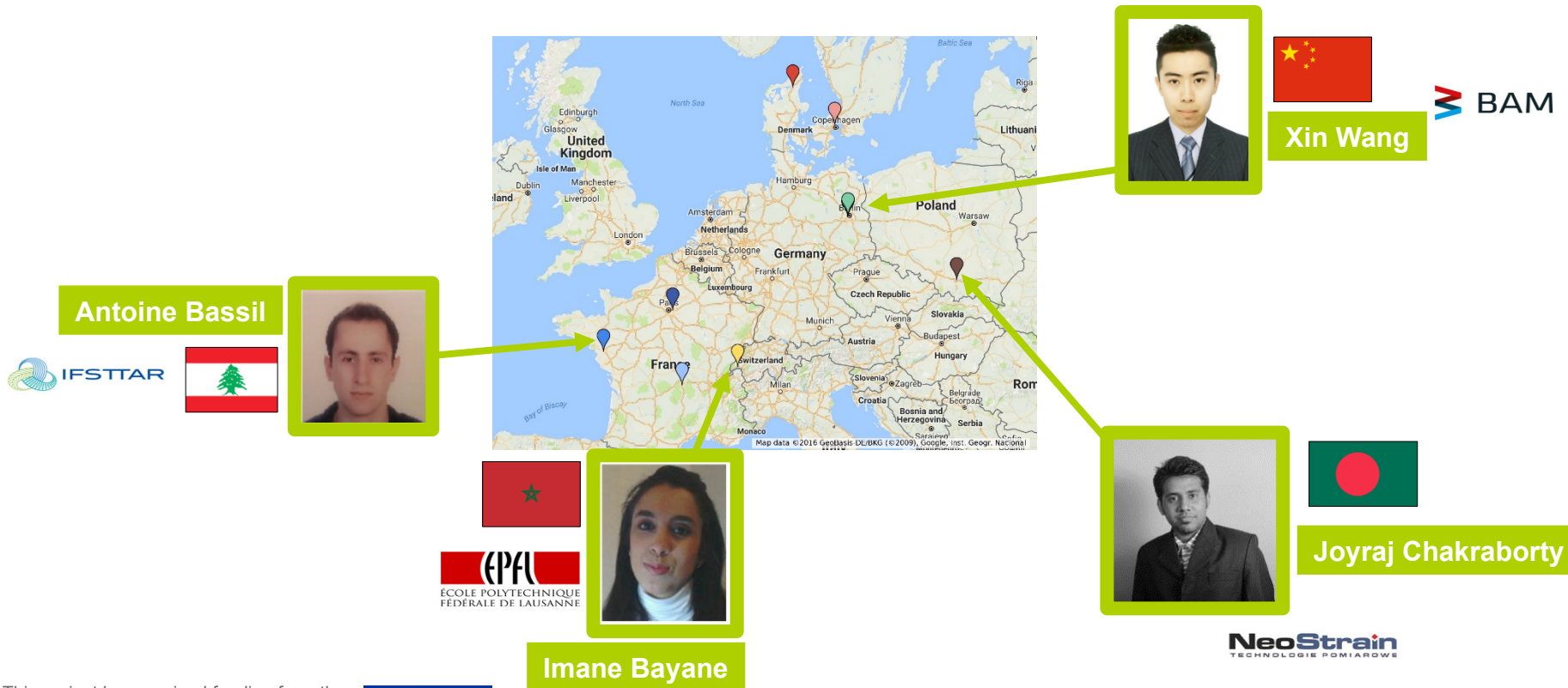


Dr.-Ing. Peter Lippert



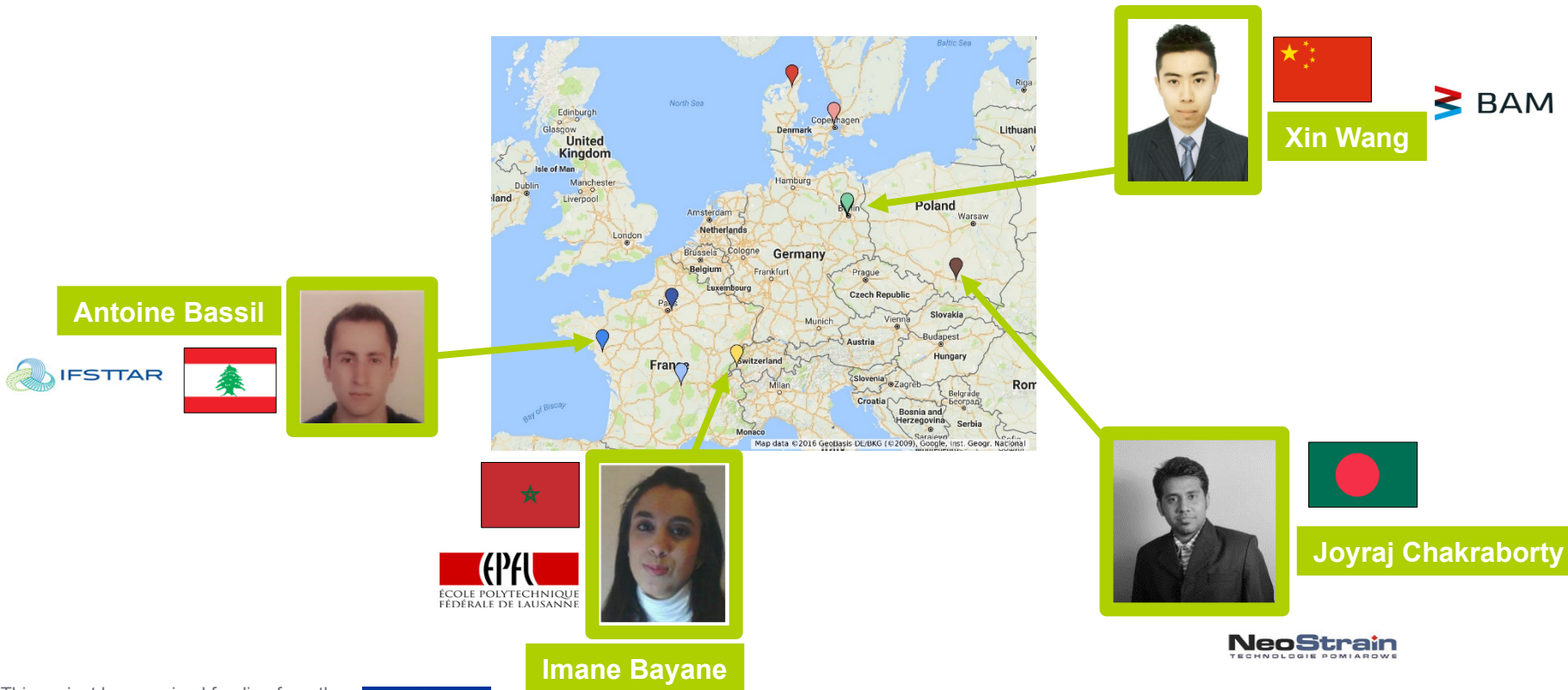
The ESRs – WP1

Advanced ultrasonic instrumentation for interferometric monitoring (Xin).
 Sensor integration, data fusion and information management for industrial monitoring systems (Joyraj).
 NDT parameters for fatigue damage identification in structural elements (Imane).
 Fibre optic for fatigue monitoring (Antoine).



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The ESRs – WP2

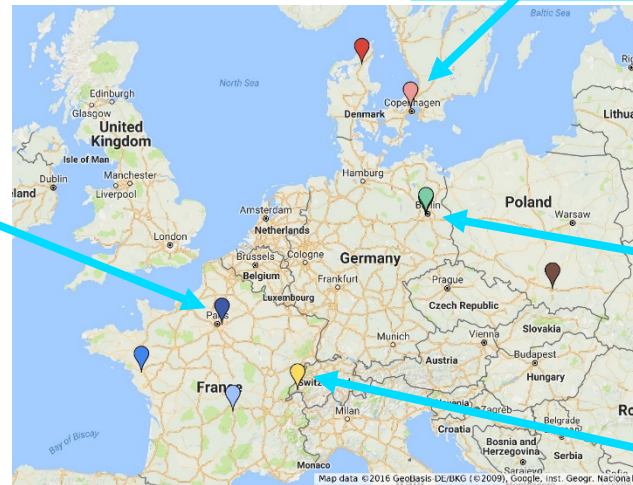


COWI



Joey Velarde

Mariia Nesterova



Gianluca Zorzi



Bartłomiej Sawicki

- Fatigue of wind turbine concrete structures (Joey).
- Lifetime cyclic behaviour of gravity base foundations for offshore wind turbines (Gianluca).
- Fatigue of reinforced concrete structural elements (Bartłomiej).
- Reliability of structures exposed to traffic loads and environmental loading (Mariia).



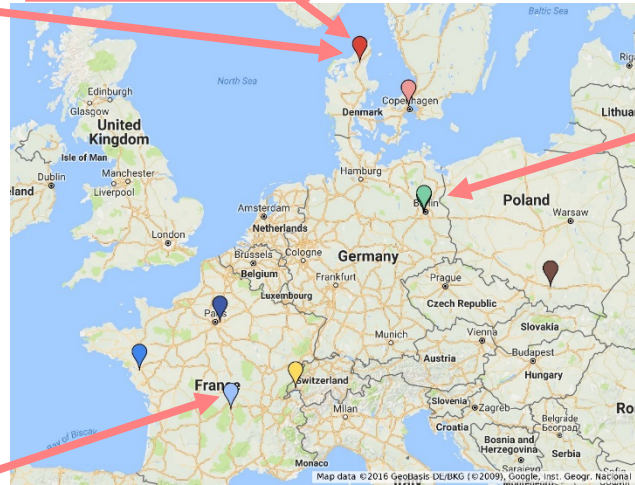
The ESRs – WP3



Amol Mankar



Sima Rastayesh



Lijia Long



Morteza Ahmadvale

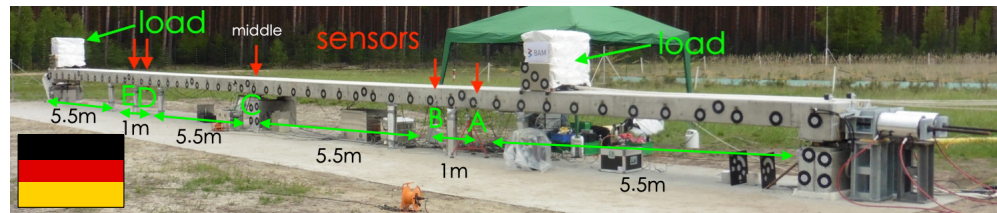


Quantification of the value of monitoring information (Lijia).
 Optimal maintenance planning of existing structures using monitoring data (Morteza).
 Fatigue reliability of concrete wind turbine towers and foundations (Amol).
 Risk assessment (Sima).

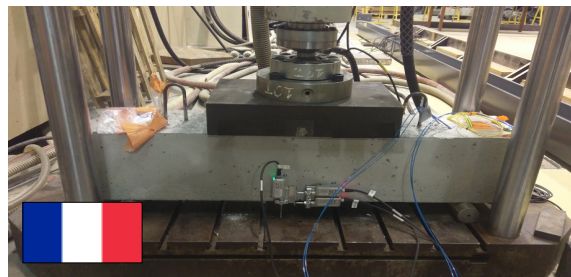


Shared Objects

- **Aims:**
 - To promote collaboration between the WPs
 - To boost ESRs collaboration
 - To exemplify the inter-sectoral approach



- **Nature:**
 - On site structures
 - Reduced scale lab
 - Models
 - Data sets
 - etc



Focus WP1 ESR1



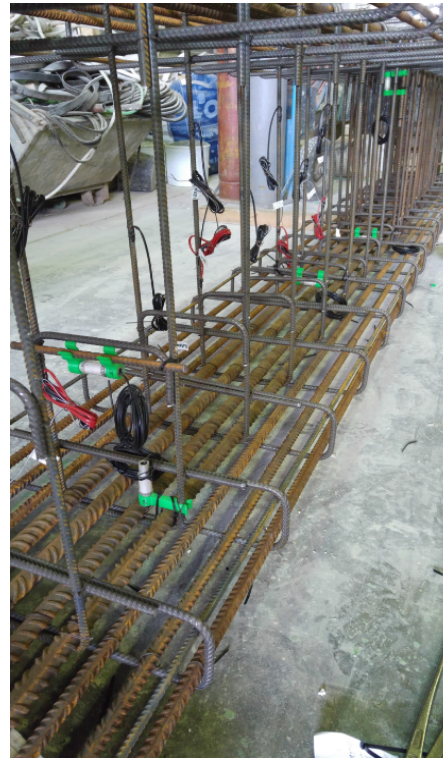
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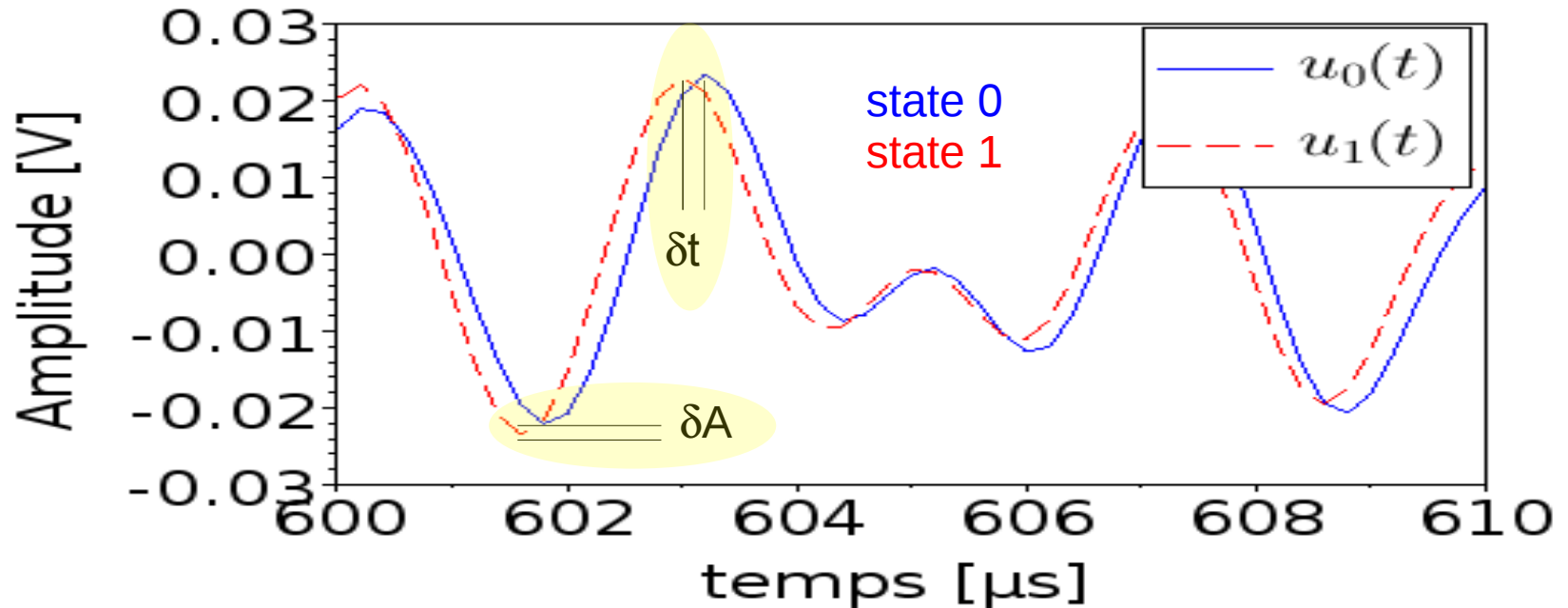


Xin WANG

Advanced ultrasonic instrumentation for interferometric monitoring



Focus WP1 ESR1

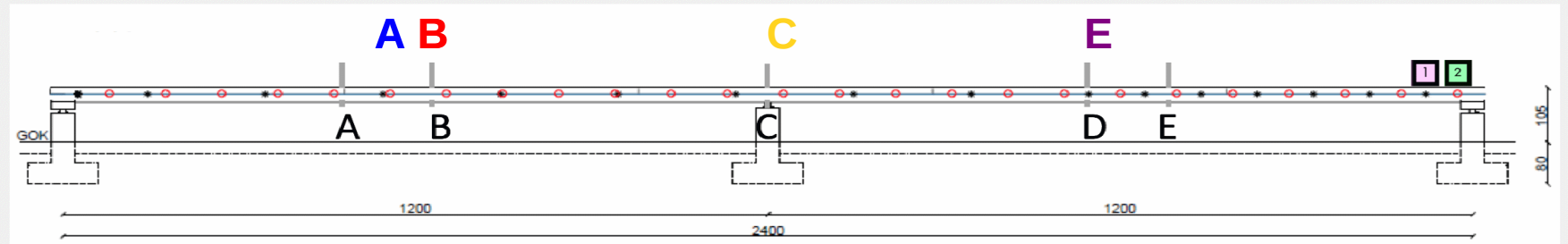
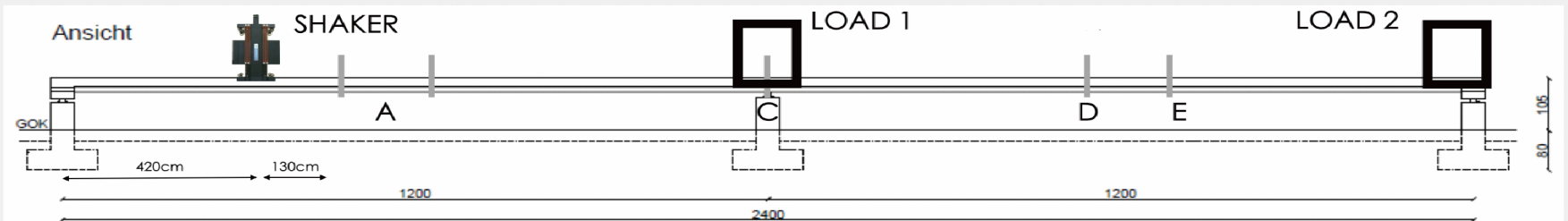
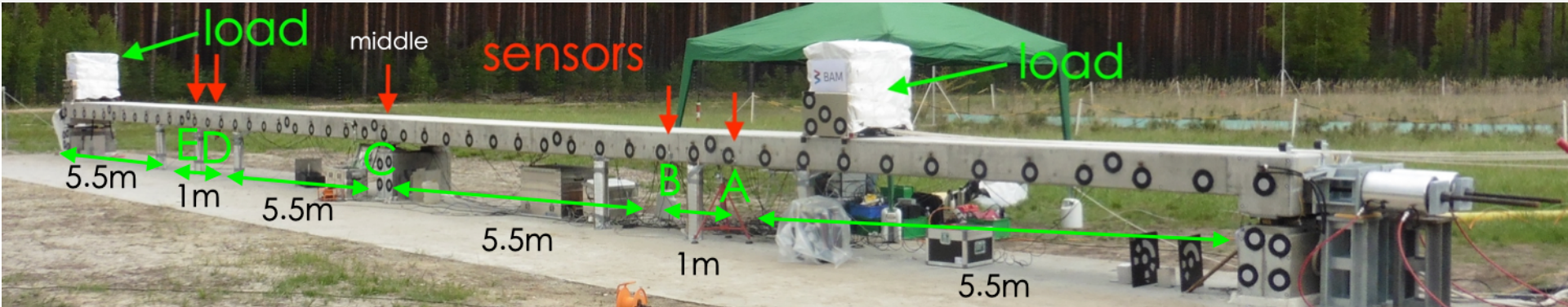


Coda :
Reproducible
Sensitive

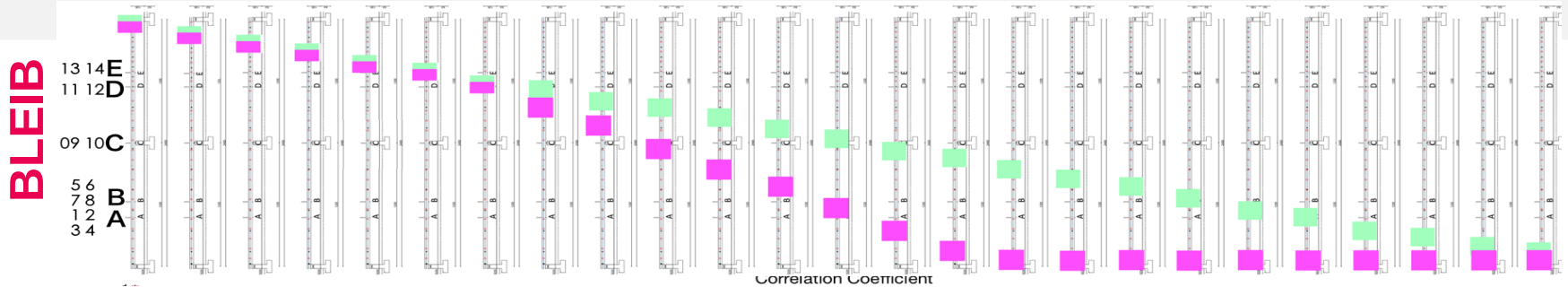
Observables (stretching) :

- Velocity variation ($\Delta v/v$)
- Correlation coefficient

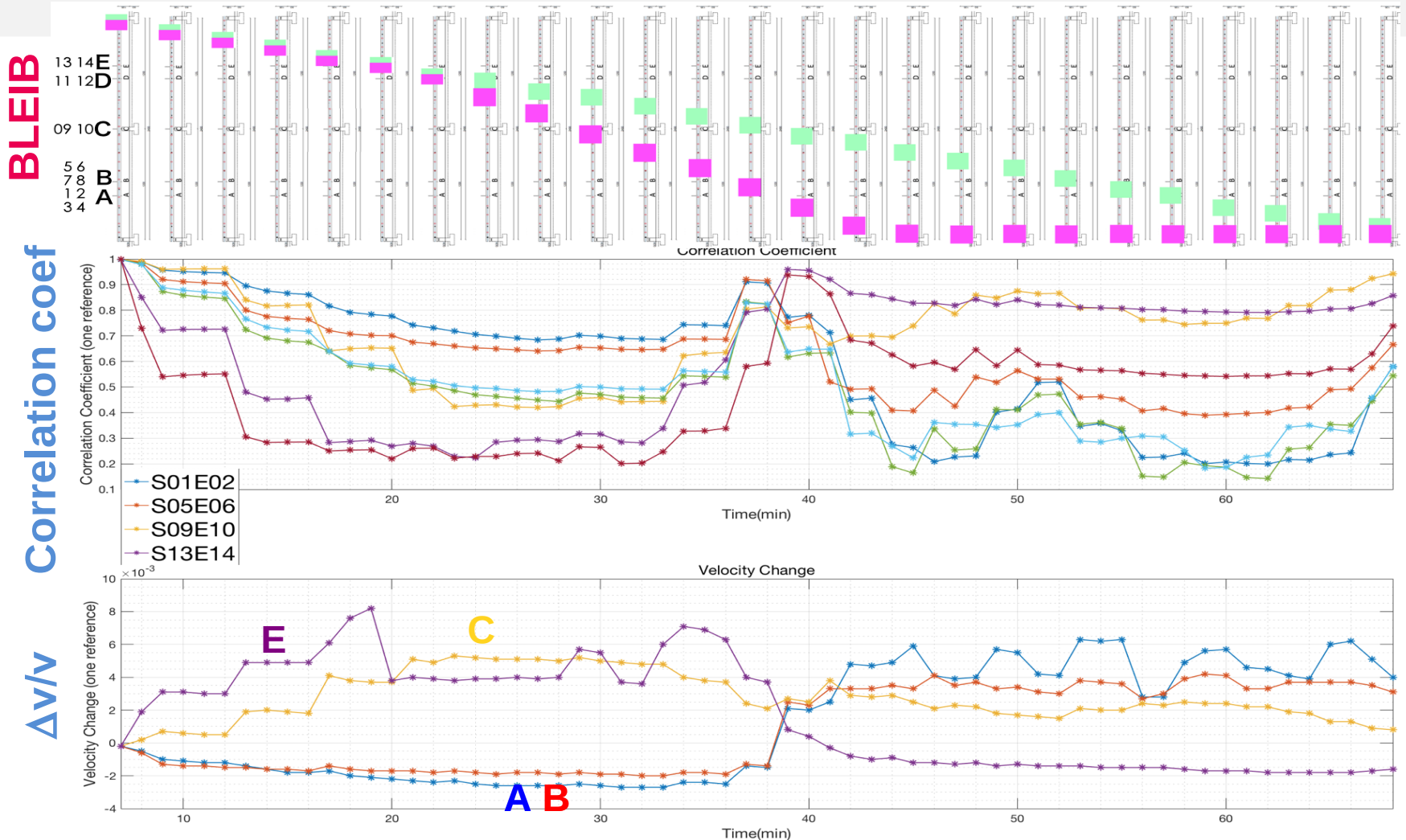
BLEIB structure (BAM)



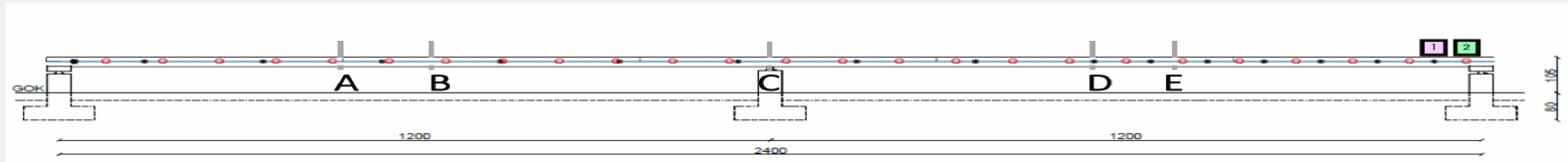
BLEIB structure (BAM)



BLEIB structure (BAM)



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Network-wide training activities

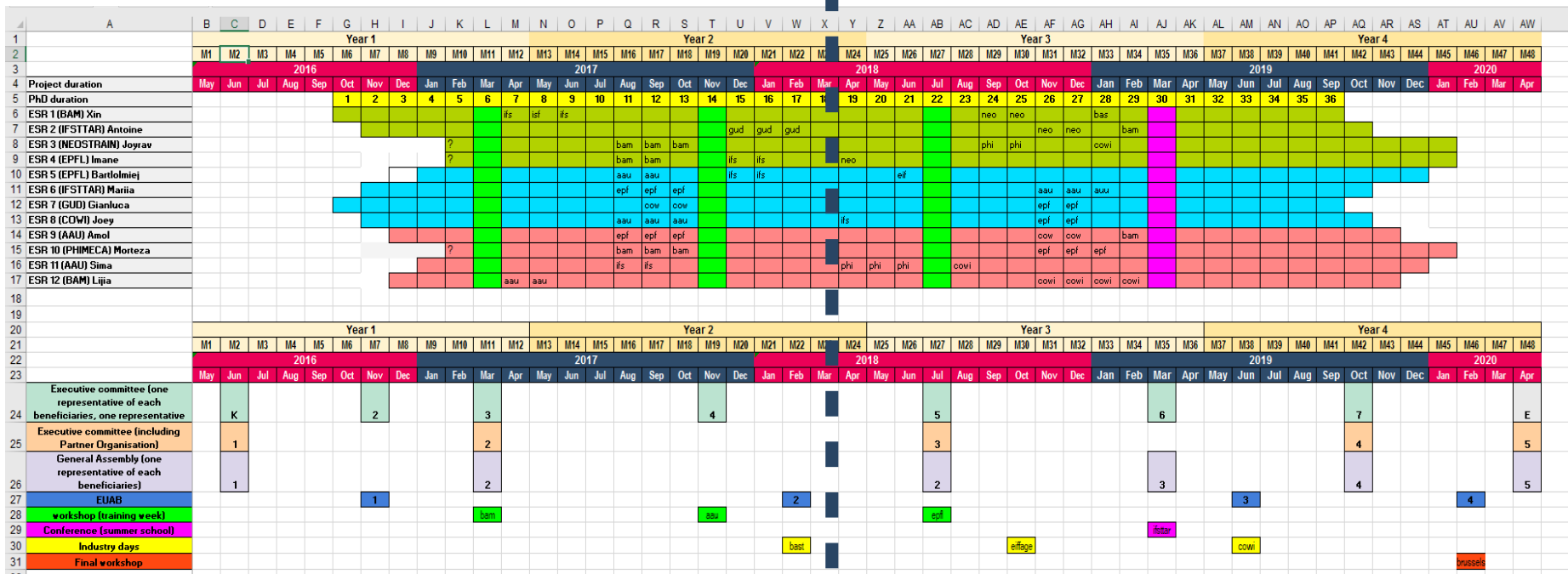
2 to 3 secondments for 2 to 3 months for each ESR.

3 training weeks: BAM (March 2017), EPFL (Nov. 2017), Aalborg (Jul. 2018).

3 implementation days: BAST (Mar.. 2018), EIFFAGE (Oct. 2018), COWI (Jun. 2019).

1 winter school: IFSTTAR (Mar. 2019).

1 final workshop: Brussels (Feb. 2020).



Innovation and Networking for Fatigue and Reliability Analysis of Structures - Training for Assessment of Risk

More information on INFRASTAR website <http://infrastar.eu> or infrastar@ifsttar.fr

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