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Metrology for low frequency sound and vibration: An introduction to the Infa-AUV project

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ORAL PRESENTATION

Metrology for low frequency sound and vibration: An introduction to the Infa-AUV project

The mission of the project:

We deliver the link between

the International System of Units (SI)

and the

the International Monitoring System (IMS)

for acoustic and seismic measurements

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WP1 Primary Calibration

Multi-component calibration device at PTB

WP2 Secondary Calibration

Infrasound calibration set-up at CEA

WP3 On-site Calibration

Infrasound station

WP4 Consequences

WP5 Impact

CEN
ISO
IEC

CTBTO
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WEBSITE
BEST PRACTICE GUIDE

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WP1 Primary Calibration

Multi-component calibration device at PTB

- Calibration with primary realization of the Unit according to standardized methods
- typically complex process in laboratory
- Well controlled environment
- Lowest measurement uncertainty

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WP1 Primary Calibration

Multi-component calibration device at PTB

- Calibration with primary realization of the Unit according to standardized methods
- typically complex process in laboratory
- Well controlled environment
- Lowest measurement uncertainty

extend the frequency range with new methods

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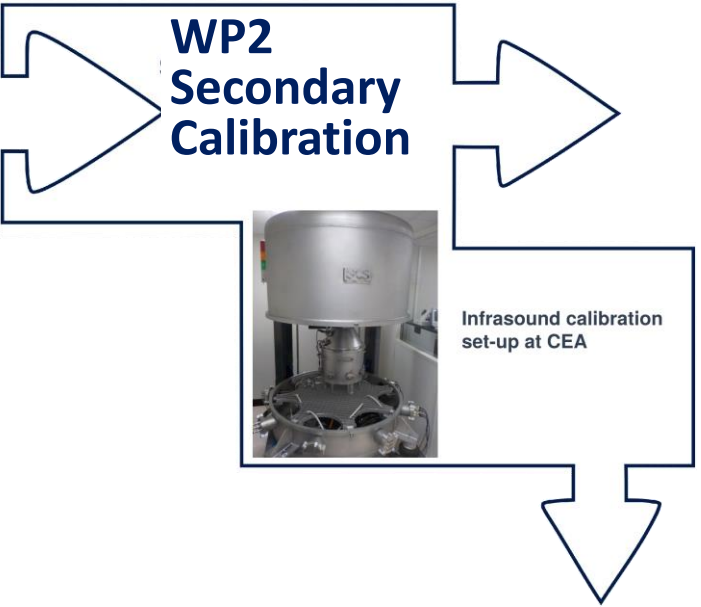

- Calibration by comparing one sensor to another
- typically simple process in laboratory
- controlled environment
- measurement uncertainty inherits from primary calibration
- needed for the multitude of sensor types

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WP2 Secondary Calibration

Infrasound calibration set-up at CEA

- Calibration by comparing one sensor to another
- typically simple process in laboratory
- controlled environment
- measurement uncertainty inherits from primary calibration
- needed for the multitude of sensor types

extend the frequency range
find appropriate reference sensors

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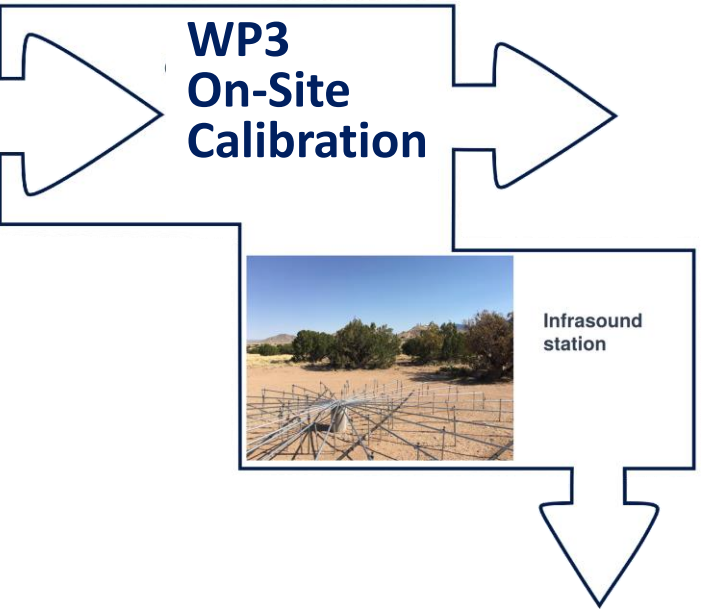

- Calibration by comparing the station to a „transfer-standard“ sensor
- Limited accessibility, maintenance
- Uncontrolled environment
- Uncontrolled (arbitrary) signal sources

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WP3 On-Site Calibration

Infrasound station

- Calibration by comparing the station to a „transfer-standard“ sensor
- Limited accessibility, maintenance
- Uncontrolled environment
- Uncontrolled (arbitrary) signal sources

Evaluate suitable signal sources for the calibration on site
Evaluate the impact of environmental conditions
Develop procedures for the comparison to get transfer functions

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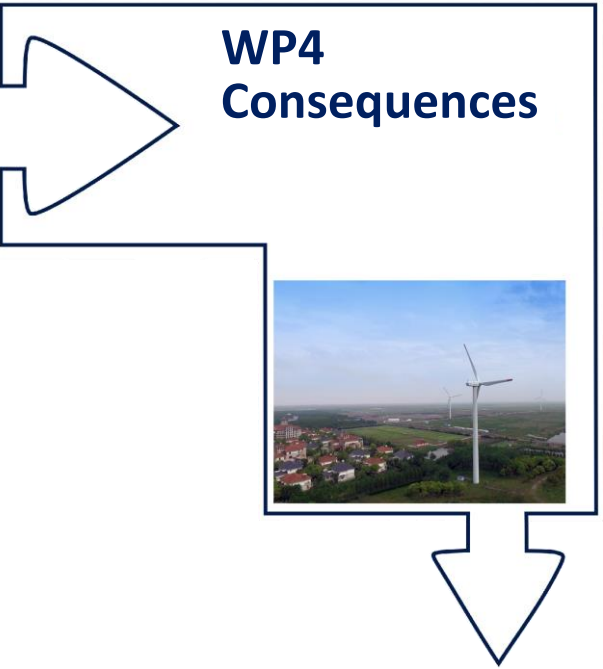

- Measurement uncertainties propagation from primary calibration to the operations on site
- How to do it right, good practise
- What‘s the impact on modelling (propagation of uncertainty)
- Support for legal metrology (noise assessment): Wind parks, Infra sound and the public

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WP4 Consequences

- Measurement uncertainties propagation from primary calibration to the operations on site
- How to do it right, good practise
- What‘s the impact on modelling (propagation of uncertainty)
- Support for legal metrology (noise assessment): Wind parks, Infra sound and the public

evaluate uncertainty of measurement
Draft a best practise guide
Show case the impact on environmental modelling

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WP5 Impact

ISO
IEC

CTBTO
ICA
EGU-Conf.

Publications in scientific journals

Contributions to international standards

Presentations at scientific conferences

Training workshops

Website and social media

Disclaimer: The views expressed on this presentation are those of the author and do not necessarily reflect the view of the CTBTO

What will be gained from Infra-AUV:

- Mutual international acceptance of measurement results (CIPM-MRA) by traceability to the SI
- Improved direct, quantitative comparability of sensors and stations
- Traceable sensor replacement
- Reliable knowledge of measurement uncertainty
- Good practise for the use of uncertainty in modelling

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https://www.ptb.de/empir2020/infra-auv

EMPIR EURAMET

The EMPIR initiative is co-funded by the European Union's Horizon 2020 research and innovation programme and the EMPIR Participating States

Infra-AUV *has received funding from the EMPIR programme co-financed by the Participating States and from the European Union's Horizon 2020 research and innovation programme*