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


O4.1-213
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 ICA EGU

WEBSITE BEST PRACTICE GUIDE
WP1 Primary Calibration

- 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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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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- 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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WP3 On-Site Calibration

- 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

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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• How to do it right, good practise

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**evaluate uncertainty of measurement**

**Draft a best practise guide**

**Show case the impact on environmental modelling**
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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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