

TC-AUV Highlights

Enver Sadıkoğlu
TC-AUV Chair
TÜBİTAK UME (Türkiye)

17th EURAMET General Assembly
Plenary Session
31 May – 1 June 2023
Tallinn - Estonia



Overview of TC-AUV



- Members: 23
- Sub-committees:
 - SC-A: Sound in Air [13]
 - SC-U: Ultrasound and Underwater Acoustics [6]
 - SC-V: Vibration and Acceleration [13]
- Working Group
CMC review
- TC-AUV Meetings: Annually



2023 TC-AUV Annual meeting, 16-17 May 2023,
BEV, Vienna, Austria [40 participants in total]

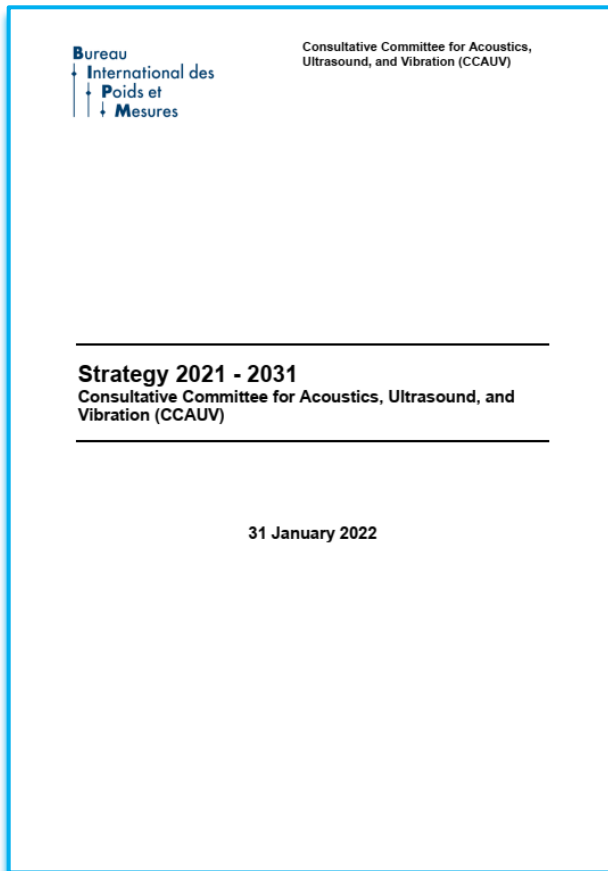
SC Convenors:

- SC-A: Erling Sandermann Olsen (HBK-DPLA, Denmark)
- SC-U: Giovanni Durando (INRiM, Italy)
- SC-V: Thomas Bruns (PTB, Germany)



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TC-AUV: Few Facts



- Almost all CCAUV key comparisons are/were piloted by EURAMET NMIs/DIs.
- CCAUV Strategy document was revised recently with substantial contribution of TC-AUV members. Chair (Enver Sadıkoğlu) and three Co-chairs (Salvador Barrera-Figueroa, Stephen Robinson and Thomas Bruns) of SPWG are from EURAMET.
- TC-AUV has strong links with relevant ISO and IEC TCs (e.g. IEC TC 29, ISO TC 108, ISO TC 43)
- CIPM MRA activities within TC-AUV are well managed.



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EMPIR Projects



Radiotherapy coupled with hyperthermia -
adapting the biological equivalent dose concept
(18HLT06 RaCHy, 2019 – 2022)



Metrology for low-frequency sound and vibration
(19ENV03 Infra-AUV, 2020 – 2023)



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



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Infra-AUV Project



Metrology for low-frequency sound and vibration (19ENV03 Infra-AUV, 2020 – 2023)

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

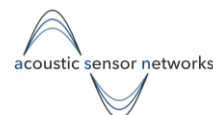


Bundesanstalt für
Geowissenschaften
und Rohstoffe



le cnam

Conservatoire national
des arts et métiers

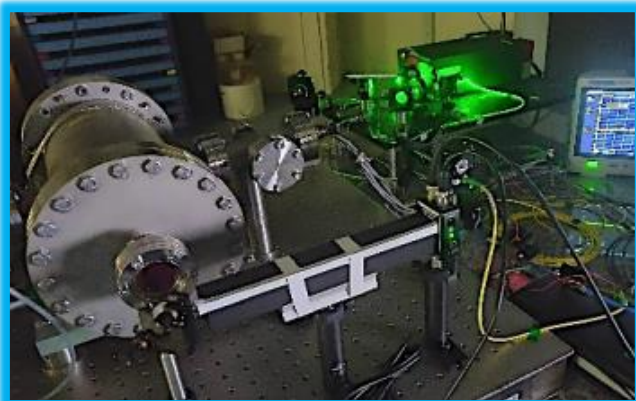


Brüel & Kjær 
an HBK company

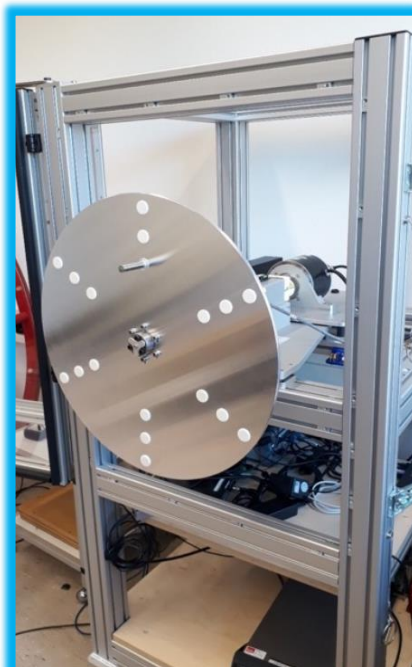


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Infra-**A**UV Project – from previous year



CNAM Fabry-Perot interferometer
0.04 Hz – 10 Hz



PTB carousel
0.1 Hz – 10 Hz



DFM manometer
apparatus



LNE Laser
Pistonphone
0.01 Hz – 20 Hz

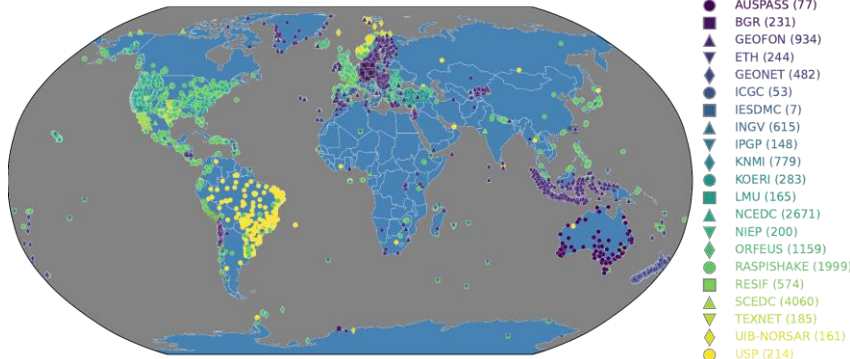
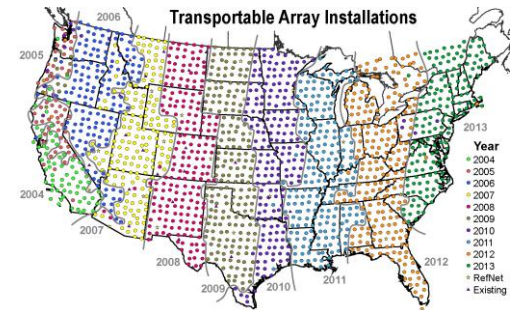
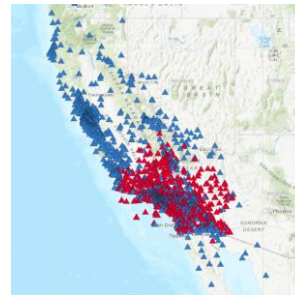
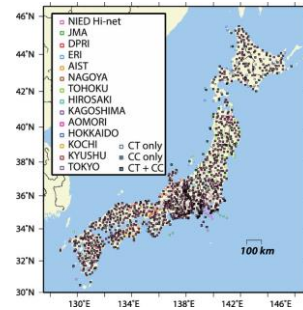
Further research on reciprocity
method resulted to new edition
of IEC 61094-2 standard
(February 2022)



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CTBTO and The International Monitoring System (IMS)

Source: www.ctbto.org



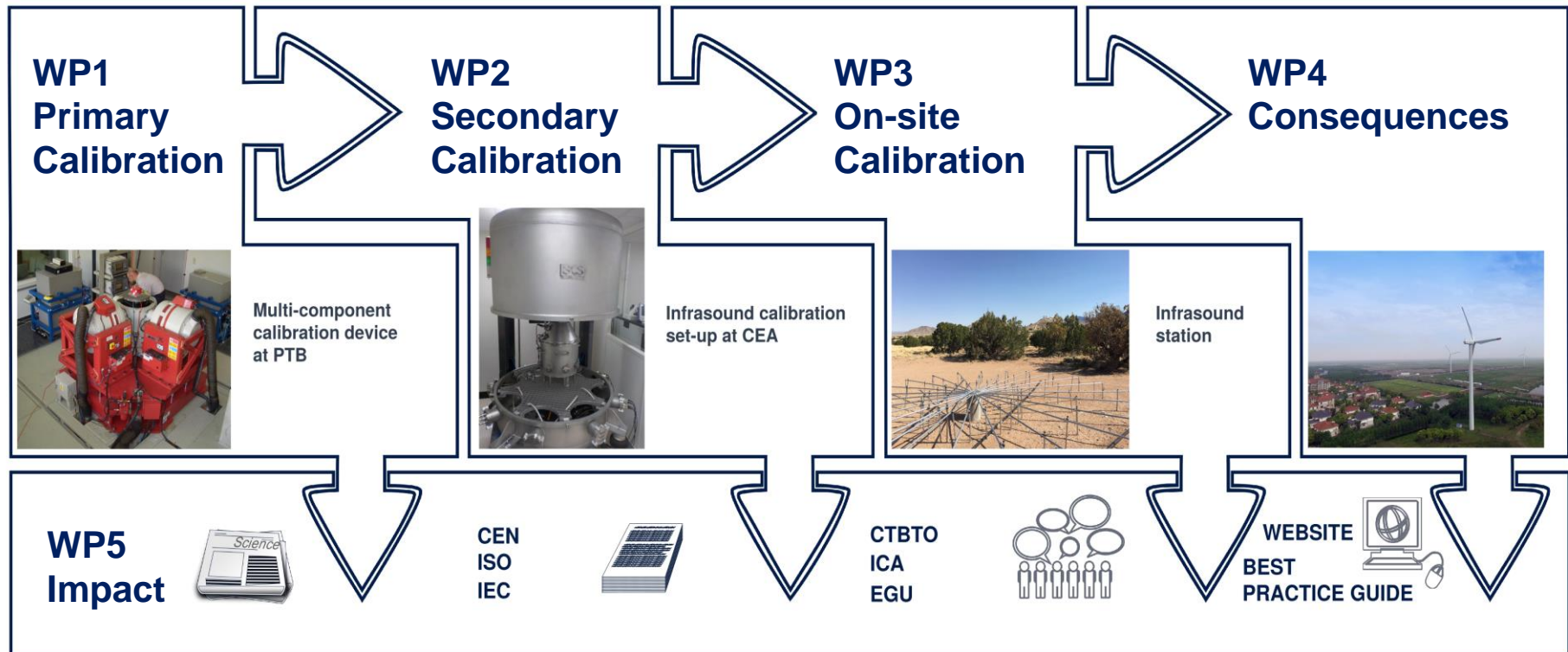
- 170 Seismic Stations Around the Globe
- thousands of sensors
- most of them IoT
- many public safety relevant

Probably None of the Measurement Results Traceable to the SI !



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Infra-AU^V Project: The Workpackage Structure

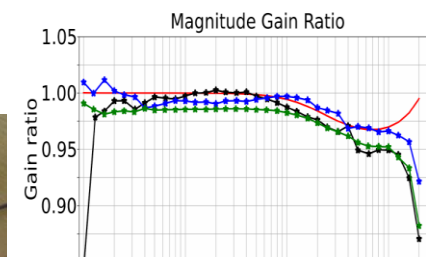
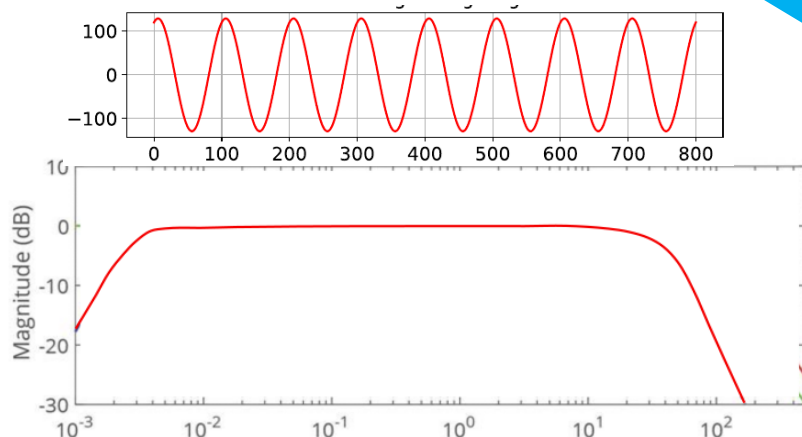
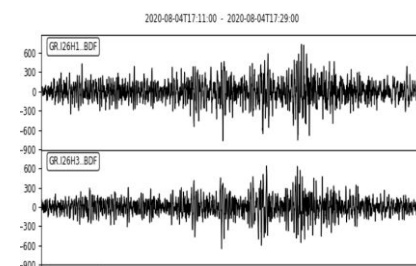
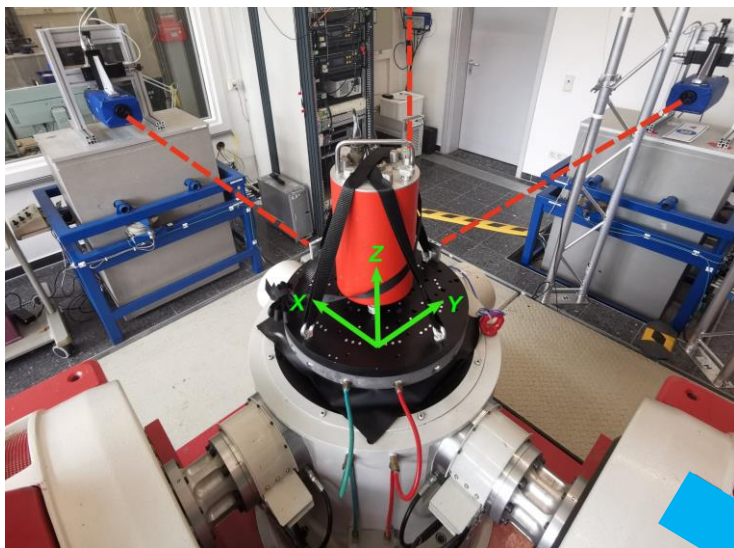


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Dissemination of the SI to environmental measurement stations (of CTBTO)



Primary Laboratory Calibration → **Secondary on-site Calibration**



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Noise pollution and Renewable Energy **EURAMET**

- **Noise a major environmental problem**
 - Recognised by WHO studies and EEA reports
 - 20% EU population suffer health effects
 - Ocean noise also harms marine life
 - Legislation needs underpinning by metrology
- **Massive expansion in renewable energy**
 - Ambitious EU targets for sustainable energy
 - Onshore and offshore windfarms
- **BUT, renewable energy ➡ noise pollution**
 - VLF sound emitted by land-based wind turbines and during offshore construction
 - Major obstacle to expansion of wind energy
 - **EMPIR Infra-AUV now** establishing standards



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Outlook for future



- Key overlaps for AUV with **Green Deal**.
 - supplying clean, affordable, secure energy
 - zero-pollution ambition for environment
 - preserving/restoring ecosystems/biodiversity
- Overlap with **EMN on Pollution** if scope expanded.
- Various type of sensors and arrays are used for noise monitoring. This bring a chance for close collaboration with **WG M4D**.
- Generation of AUV related input for **DCC** is currently in the TC-AUV agenda.
- Collaboration and cross-cutting projects (**Health**) focusing on issues related to hearing assessment and perception are of permanent interest for TC-AUV.



Thank you for your attention!

