



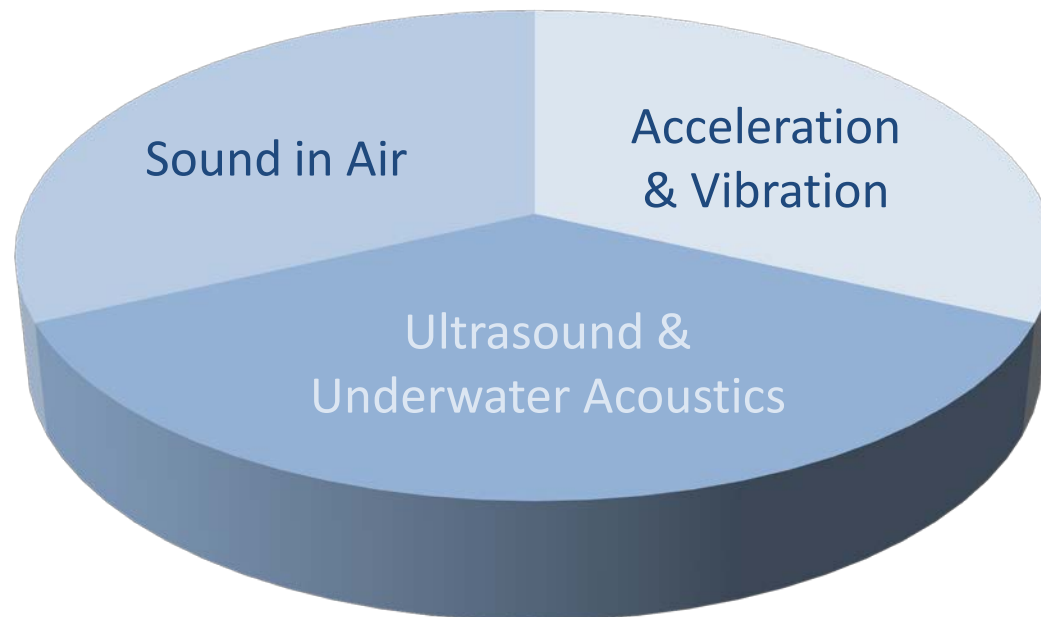
EURAMET TC-AUV 2014 highlights

Richard Barham
TC-AUV Chair

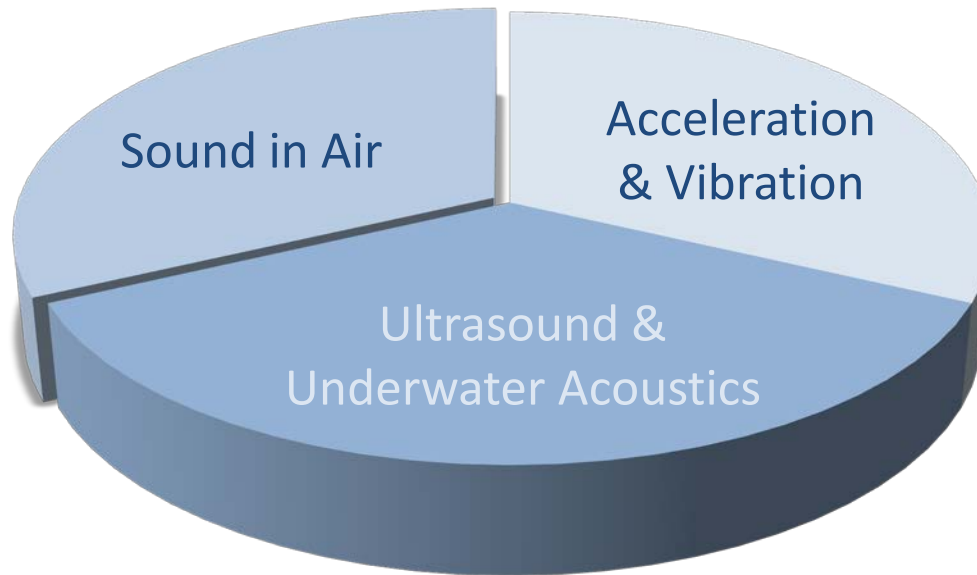
8th EURAMET General Assembly- Cavtat, June 2014



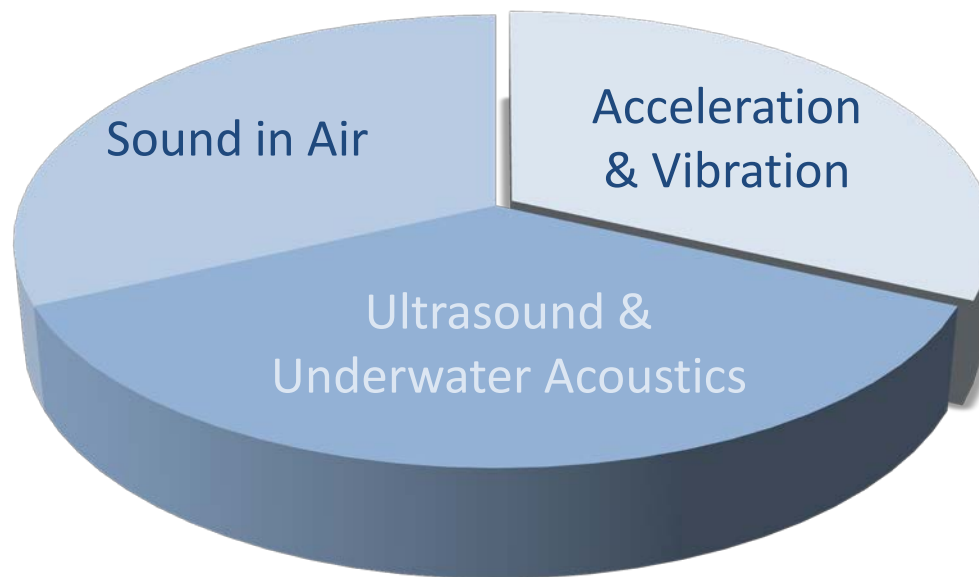
Scope of TC-AUV



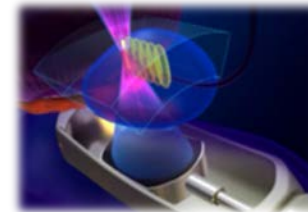
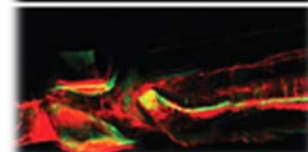
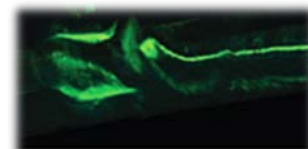
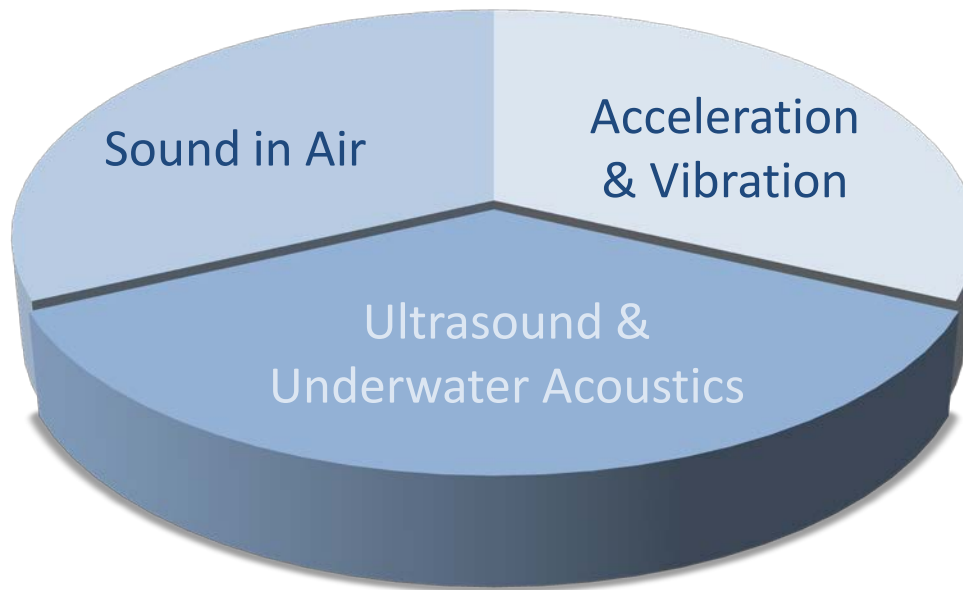
Scope of TC-AUV



Scope of TC-AUV



Scope of TC-AUV





EMRP case study : *EARS* Project (HLT01)

Safety criteria and risk assessment methodology for non-audible sound (airborne ultrasound and infrasound) based on an evaluation of human perception thresholds using neuro-imaging techniques as indicators of perception



EMRP *EARS* : Beyond state-of-the-art

- New primary standards established for sound pressure in the frequency range 20 kHz to 120 kHz
- Realised through the calibration of measurement microphones
- The world's first and only measurement capability providing traceability in this frequency range
- Would not exist without EMRP





EMRP *EARS* : Creating impact

- Wolfson Microelectronics provide MEMS microphones to the consumer electronics market
- A high profile client and leading cell phone manufacturer had requirements to understand the performance envelope of MEMS microphones in the ultrasound region up to 100 kHz
- Secondary calibration methods traceable to the new primary standard provided a unique solution addressing the need



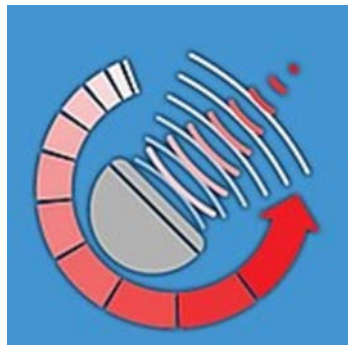
Feedback from Wolfson...

*"We were able to use the excellent reports provided, almost verbatim. **The client was extremely impressed** by the quality and clarity of reporting and content, **and considered the work to be definitive**. They raised no further questions or requests for further information from Wolfson. **We regard this as the perfect outcome** and would like to pass on our sincere thanks to those involved."*



EMRP case study : *DUTy* Project (HLT03)

Develop the concept of **dose** for therapeutic ultrasound applications, and the metrology to underpin appropriate treatment planning and risk assessment, laying the foundations for new international standard and best practices





EMRP *DUTy* : Stakeholder engagement

- A web-based survey was established to elicit views across the scope of the project (concepts-metrology-standards)
- 120 responses with global coverage
- Indication that there exists a lack of consensus and some misunderstanding of dose concepts
- Majority are of the opinion that greater development and common understanding of dose will lead to significant benefits
- The survey has identified a wide stakeholder community to target for dissemination

Dosimetry for Ultrasound Therapy: Measurements and Dose

Your therapeutic ultrasound application

Please tell us about the applications of therapeutic ultrasound with which you have a significant involvement at present or within the past 3 years and about the transducers and acoustic fields that you work with.

1. What applications of therapeutic ultrasound are you involved with?
Please tick all that apply.

<input type="checkbox"/> Metrology/QA rather than specific applications	<input type="checkbox"/> Other general work not related to a specific application (e.g. modelling, bioeffects studies)
<input type="checkbox"/> Shockwave Lithotripsy	<input type="checkbox"/> Neurostimulation/modulation
<input type="checkbox"/> Other shockwave therapies	<input type="checkbox"/> Drug delivery
<input type="checkbox"/> Histochemistry	<input type="checkbox"/> Physiotherapy
<input type="checkbox"/> Thermal ablation (incl. HIFU)	<input type="checkbox"/> Low intensity therapies (bone and soft tissue healing)
<input type="checkbox"/> Haemostasis	<input type="checkbox"/> Aesthetic - fat removal
<input type="checkbox"/> Thrombolysis	<input type="checkbox"/> Aesthetic - e.g. facelift/wrinkle reduction
<input type="checkbox"/> Others (please specify) _____	

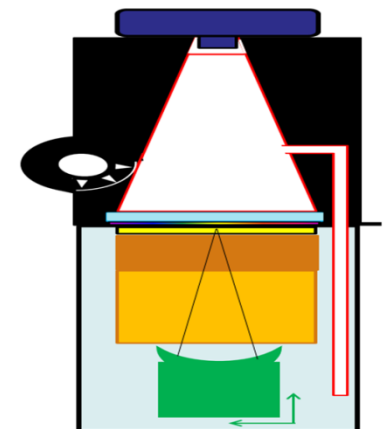
2. If your work is directly related to treating patients, what type of tissue are you intending to treat?
Please tick all that apply.

<input type="checkbox"/> Metrology/QA rather than direct treatment	<input type="checkbox"/> Other general work not directly related to a specific treatment site (e.g. modelling, bioeffects studies)
<input type="checkbox"/> Liver	<input type="checkbox"/> Bladder/urinary tract
<input type="checkbox"/> Kidney	<input type="checkbox"/> Prostate
<input type="checkbox"/> Heart	<input type="checkbox"/> Uterus
<input type="checkbox"/> Pancreas	<input type="checkbox"/> Other reproductive organs
<input type="checkbox"/> GI tract	<input type="checkbox"/> Breast
<input type="checkbox"/> Other internal organs	<input type="checkbox"/> Muscle
<input type="checkbox"/> Brain	<input type="checkbox"/> Adipose tissue
<input type="checkbox"/> Nerves	



EMRP *DUTy* : Scientific excellence

- At the mid-point of the project DUTy has produced
 - 17 scientific papers published in leading peer review journals
 - 63 presentations and posters for conferences, meetings and symposia
- Established new calibration sources, transfer standards and measurement phantoms
- Provides input to 3 published and draft IEC Standards



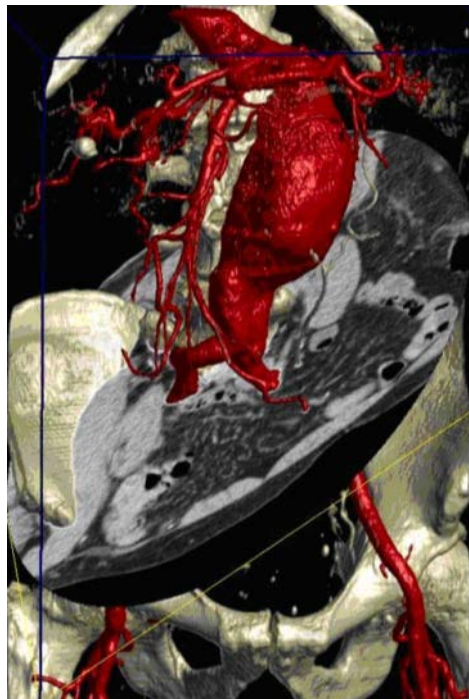
Links with EMPIR & Horizon 2020



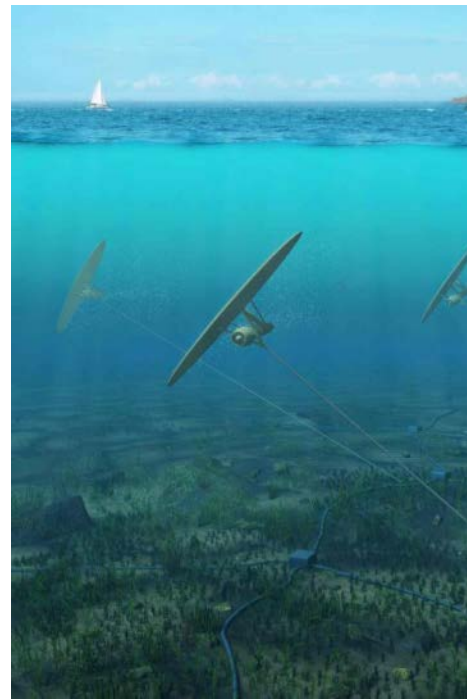
Future Cities

Sustainable urban and marine environments

Secure, clean and efficient Energy



Advanced medical
imaging



Marine renewables

Innovation in industrial process control

Sensor networks



Digital technologies



Thank you

