

## SIM Acoustics & Vibration Report

Alfredo Elías (aelias@cenam.mx)  
SIM MWG9<sup>‡</sup> Chairman

### AUV comparisons

1. **SIM.AUV.A-K1** LS1P microphone calibration by pressure reciprocity  
Linking to CCAUV.A-K1 LS1P microphone comparison is in progress. Measurand: pressure sensitivity level from 125 Hz to 8 kHz. NRC as pilot laboratory is taking care of this task. CENAM is providing some support regarding calculation of degrees of equivalence. Preliminary calculations have been done and distributed among participating NMIs.
2. **SIM.AUV.V-K1** Accelerometer calibration by interferometric techniques  
Linking to CCAUV.V-K1 accelerometer comparison is needed. Measurand: charge sensitivity from 50 Hz to 5 kHz. NIST as pilot laboratory is taking care of this task. CENAM will be supporting the pilot laboratory with preliminary calculations of degrees of equivalence.
3. **SIM.AUV.A-S1** Pistonphone acoustical calibrators.  
Draft A has been circulated to participating laboratories. Measurands: a) sound pressure level, b) frequency, and c) total harmonic distortion. It is not clear if linking to key comparison CCAUV.A-K1 shall be needed or if linking to SIM.AUV.A-K1 comparison would be sufficient.
4. **Low frequency accelerometer calibration** (registration in progress)  
Draft protocol has been distributed for comments; time-table for this comparison may still have modifications. Currently, it is set to start on Oct-2004 and to be finished by Jun-2006. Measurand: charge sensitivity at the following frequencies: 2 Hz, 4 Hz, 5 Hz, 8 Hz, 10 Hz, 16 Hz, 25 Hz, 40 Hz, 80 Hz, 100 Hz, and **160 Hz** (reference).

Participating laboratories:

| NMI - Country                        | Contact   |
|--------------------------------------|---|
| INMETRO - Brasil                     | Gustavo P. Ripper, e-mail: <a href="mailto:lavib@inmetro.gov.br">lavib@inmetro.gov.br</a>   |
| INTI - Argentina                     | Lucia Taibo, e-mail: <a href="mailto:luciat@inti.gov.ar">luciat@inti.gov.ar</a>   |
| NRC - Canada                         | George Wong, e-mail: <a href="mailto:George.Wong@nrc.ca">George.Wong@nrc.ca</a>   |
| NIST - USA                           | David J. Evans, e-mail: <a href="mailto:dje@nist.gov">dje@nist.gov</a>  |
| CENAM – Mexico<br>(pilot laboratory) | Guillermo Silva-Pineda, e-mail: <a href="mailto:gsilva@cenam.mx">gsilva@cenam.mx</a> ,<br>Alfredo Elías, e-mail: <a href="mailto:aelias@cenam.mx">aelias@cenam.mx</a> |
| KRISS – Korea*                       | Sang Joon Suh, e-mail: <a href="mailto:sjs@kriss.re.kr">sjs@kriss.re.kr</a>   |
| NMIJ –Japan*                         | Takashi Usuda, e-mail: <a href="mailto:Takashi.usuda@aist.go.jp">Takashi.usuda@aist.go.jp</a>   |

\* Official participation to be confirmed.

This project started as a supplementary comparison within SIM MWG9, however recent interest from other NMIs suggests that perhaps this comparison may be a good prospect for a CCAUV key comparison. Acceleration measurements at low frequency are very

<sup>‡</sup> SIM Metrology Working Group 9



## CCAUV/04-18

common in vibration metrology and have great impact on a large number of applications. Issues of comparability, traceability and equivalence of vibration measurements at low frequencies would get, from our point of view, a much strong evidence to support claimed CMCs; particularly at frequencies below 40 Hz. Comments from other NMIs/RMOs are very much welcome.

### **Peer evaluations, quality systems and future tasks**

SIM Council created in 2002 the so called SIM Quality System Task Force (SIM QS TF) to review the QS in SIM CIPM-MRA signatories. Quality Systems associated to a given set of CMC are being approved following the document "SIM Procedure for Review of the Quality System of NMIs".

NRC has gone thru a full peer review process with peers from PTB and NATA. An accreditation is being expected. INMETRO, INTI, NIST and CENAM are going thru their respective peer reviews. These would be concluded by Dec 2004 or sooner.

Future SIM MWG9 activities and projects shall be directed towards improving the participation of more SIM NMIs; currently only INTI, INMETRO, NIST, NRC and CENAM have a constant participation. NMIs from Central America and South America are being contacted in order to address feasible AUV activities of their interest.

INTI has submitted a revised set CMCs for regional and interregional review. Mainly, identification codes were updated, pressure sensitivity level of LS1P mics by comparison was deleted and frequency range in pressure sensitivity level by comparison was reduced. The rest of SIM MWG9 members are also being invited to revise their current list of CMCs.

### **SIM MWG9 future comparisons: feasible projects**

- reference sound sources
- ultrasound power measurement
- phase calibration of accelerometers
- shock calibration of accelerometers
- calibration of impedance heads for audiometers

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