Recent Activities in AUV for KRISS

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Contents

- Brief Comments on APMP Meeting in 2005
- Acoustics
- Ultrasound
- Vibration

APMP Meeting in 2005

- **ICC Jeju, Jeju Island**

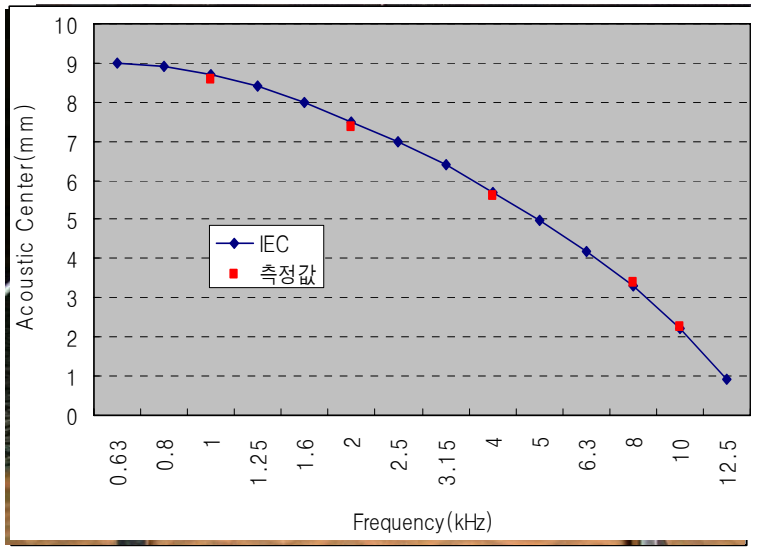
- **Hosted by KRISS**
  - 22 Countries
  - About 300 registered members

- **5-th TCAUV Meeting**
  - Held at 5-SEPT-2005
  - Participants:
    - 10 countries
    - 17 registered members
  - New Chairman of TCAUV
    - Dr. Prem Narang

Acoustics

- Contact Points:
  - Name: Dr. Sang Joon Suh
  - Email: sjs@kriss.re.kr
  - Name: Dr. Hyu Sang Kwon
  - Email: hyusang@kriss.re.kr

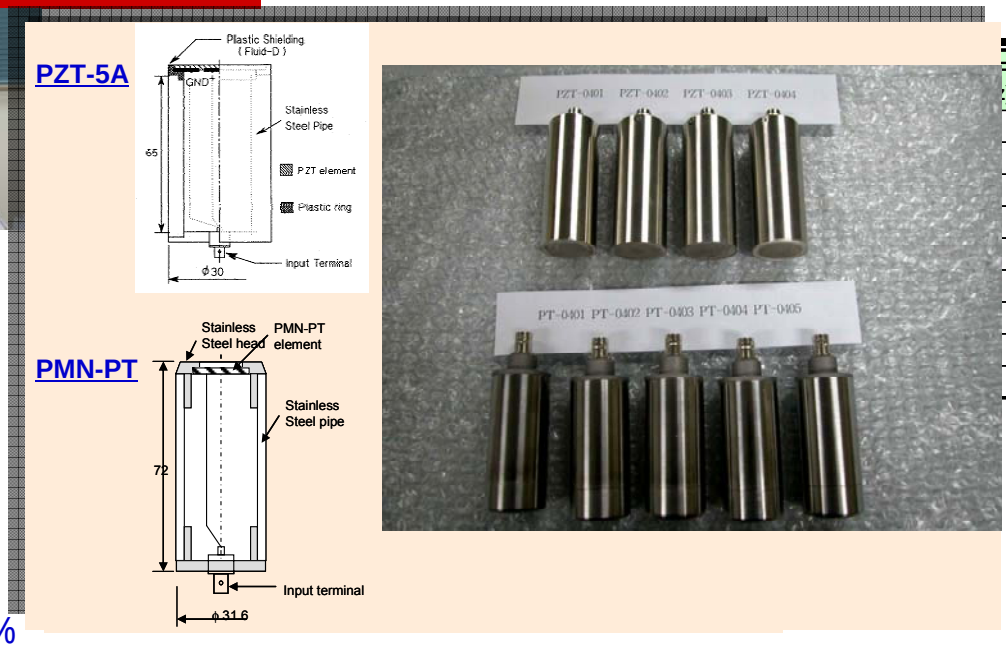
- **Free-field microphone sensitivity calibration**
  - Project year: 2004~2006
  - Frequency range: 1 ~ 20 kHz
  - Uncertainty: 0.06 ~ 0.2 dB
  - Research under development
    - *Deduction of cross-talk*
    - *Measurement of acoustic centre*



- **Pilot lab. for APMP.AUV.A-K3**
  - Project year: July-2006 ~ June-2007
  - 10 Countries

Ultrasound

- Contact point:
  - Name: Dr. Yong Tae Kim
  - Email: ytkim@kriss.re.kr



- Ultrasonic power measurement
  - CMC
    - 10 mW – 20 W (upto 5 MHz)
    - 10 mW – 1 W (upto 15 MHz)
    - Expanded Uncertainty : 4 % - 12 %
  - Response of radiation force balance for pulsed and arbitrary waveforms
  - Element-by-element acoustic power measurement of ultrasound array transducers
  - Incidence angle dependence
  - A member of CENAM members visited KRISS and discussed ultrasound power measurement and ultrasound field characterization at May 2004.
  - Informal bilateral comparison between KRISS and NMIJ using NPL test source Dec 2005.
  - Development of reference source transducers (PMN-PT)

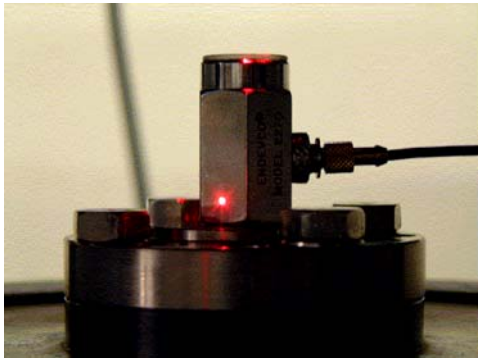
Vibration: Linear Acceleration

Contact point:

- Name: Dr. Doo Hee Lee
- Email: dhlee@kriss.re.kr

Analysis of Transverse Vibration of Reference Accelerometers

Frequency	Transverse acceleration, m/s^2				
Hz	P1	P2	P3	P4	P5
630	0.26	0.12	0.08	0.32	0.51
1000	0.18	0.22	0.07	0.21	0.53
1250	0.27	0.40	0.79	1.09	1.02
1600	1.53	0.77	1.28	0.90	1.97
2000	0.74	0.66	0.85	1.10	1.74
2500	1.23	2.93	4.42	6.36	7.47
3150	0.92	1.60	2.36	3.32	4.26
4000	3.35	6.63	9.90	14.19	17.77
5000	6.37	11.96	16.92	23.42	29.40

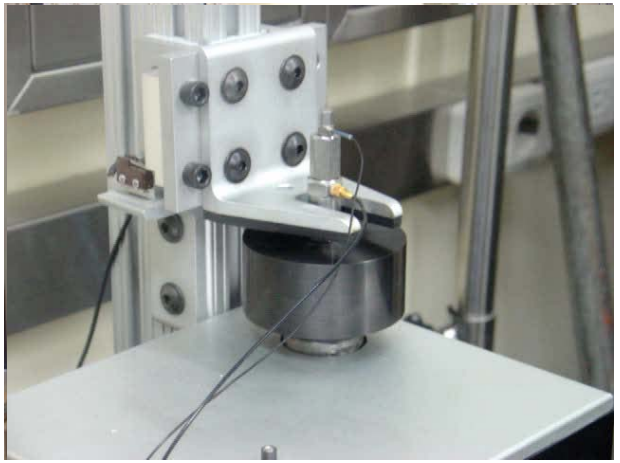


Expansion of Calibration Frequency (in progress)

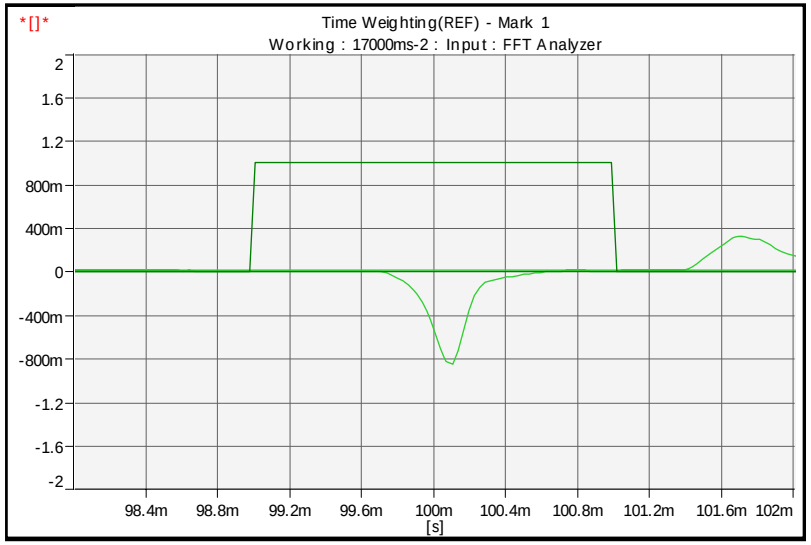
- Project year: 2006 ~ 2007
- Frequency range: 5 ~ 20 kHz
- Feasibility study on PZT exciter

Vibration: Linear Shock

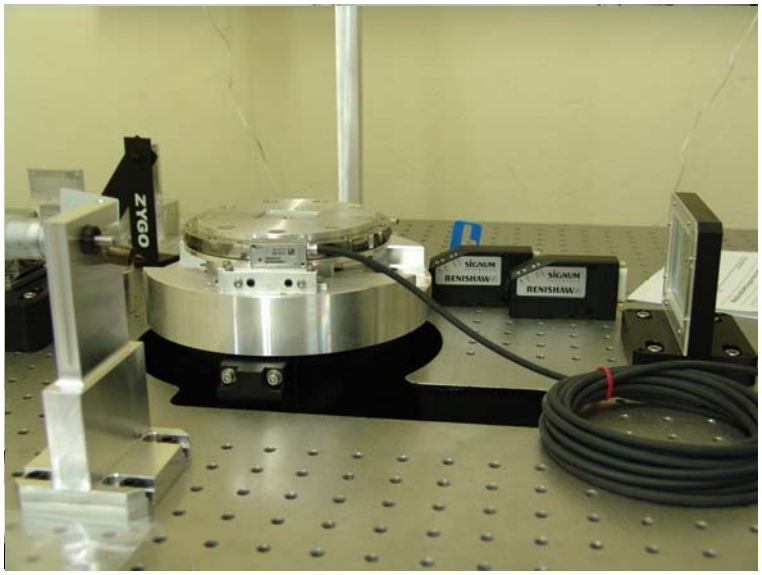
- **Contact point:**
  - Name: Mr. Yong Bong Lee
  - Email: lyb@kriss.re.kr



- **Comparison calibration of shock pickups**
  - Project year: 2005 ~ 2006
  - Pulse width : 0.5 ms ~ 1 ms
  - Shock acceleration : 500 ~ 20,000 m/s^2
  - Uncertainty : 3 % (k = 2)



Vibration: Angular Motion



- **Contact point:**
  - Name: Dr. Wan-Sup Cheung
  - Email: wansup@kriss.re.kr
- **New Primary Calibration System**
  - **New laser interferometer**
    - Angular prism + DPMI
    - ZMI4004 measurement board
    - Uncertainty: 0.49 μ-radian (k = 2, ±30 °)
  - **Low frequency angular exciter**
    - Direct driven rotary + Digital power amplifier
    - Characteristics:
      - 0.1 % ~ 1.0 % HDR for 0.1 Hz ~ 8 Hz
      - 2.0 % ~ 5.0 % HDR for 10 Hz ~ 160 Hz
  - **Transducer output measurement sub-system**
    - Dual 7.5 digit DMM with 1.8 MS/s isolated digitizer
    - Voltage & current signals measurable
    - Full digital measurement using EASM (Equi-Angle Sampling Method)
      - Amplitude measurement uncertainty: 0.04% (k =2)
      - Phase delay measurement uncertainty: 0.05 degree (k = 2)