Acceleration as a “fundamental unit”
for dynamic measurements

Thomas Bruns, as Coordinator of EMRP-IND09
Mechanical units we care for

- Force measured in Newton (N)
- Torque measured in Newton \cdot meter (N \cdot m)
- Pressure measured in Pascal (PA)
- (amplifier sensitivity in \frac{V}{(mV/V)} or \frac{V}{pC} or …)
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All in terms of frequency response or dynamic system parameters
Schlegel et al.

**Force as mass times acceleration**

- Mass is one-time calib.
- Acc. is the dynamic quantity
- Acc. needs traceability
- Acc. needs methodical consultancy
- Acc. needs analysis experience

Shock pressure as example
Shock pressure as another example

Experience in methods and procedures

Diagram: Drop weight, Piston, DUT, Mirror, Windows & sealing, Pressure cavity, Laser vibrometer.
Sinusoidal torque as yet another example

Primary angular acceleration measurement
• acceleration is the base of dynamic measurement in mechanics
• new fields of metrology will require traceability
• new options for co-operation
  new challenges, too
• borderline work between
  TC-AUV and TC-M (WGs)
  CC-AUV and CCM (WGs)