

Paper to present at technical session  
SMRI Porto Spring Conference April 27-30 2008

**Interpretation of Sonar Measurements –  
Consequences of apparently insignificant Effects**

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**abstract**

If a sonar measurement is done by a sonar tool hanging free within the cavity, just under the influence of gravity, the reference frame is oriented to the nadir/zenith automatically. In some cases, e.g. roof measurements, only the ultrasonic transducer is outside the casing but the most part of the sonar tool is inside. Given, that the casing is not exactly plumb-vertical, the inclination of the casing is carried over to the sonar tool. Usually this effect seems apparently insignificant. But actually, even a small inclination has consequences to the determination of the azimuth and the height of each measured point, if measurements are done with tilted sonar transducer.

The paper illustrates the effect of inclination to sonar measurements, discusses the influencing parameters and points out the border line to significance. The reader will get a further but widely unknown criteria for assessing the quality of sonar measurements.