

# ACCURATE ECHOMETRIC SURVEYING OF CAVITIES

-

## THE PHYSICS AND TOOL TECHNOLOGY

*by*

Andreas J. Reitze, DEng

Hartmut von Tryller

SOCON Sonar Control Kavernenvermessung GmbH

### **ABSTRACT:**

The surveillance of cavities requires numerous parameters to be measured by applying a variety of survey methods. To ensure safe cavity operations it is particularly important that the cavity geometry be reliably determined by echometric surveying. The BSE echo tool recently developed by SOCON represents a new generation of tools for use in gas, brine and oil filled cavities. This tool sets new standards for accuracy as well as for measuring through the casing.

In this paper the physics of echometric surveying are explained. Moreover, the significant components for achieving high accuracy are described, components such as transmitter-receiver unit, rotate/tilt controller and acoustic velocity measurement. The emphasis here is put on how the physics and characteristics of echometric surveying have been considered in the design of the new tool so as to be able to guarantee the accurate measurement of cavities.

©2023 – Solution Mining Institute

Full Paper is Available in the SMRI Library([www.solutionmining.org](http://www.solutionmining.org))