

Geophysical Exploration using Proton Nuclear Magnetic Resonance

Yoshito NAKASHIMA

*Institute for Geo-Resources
and Environment
e-mail:*

*nakashima.yoshito@aist.go.jp
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I am developing a portable proton nuclear magnetic resonance (NMR) surface scanner for geotechnical engineering. The proton NMR refers to a spectroscopy to observe the precession of the proton or nucleus of hydrogen. Because there are many hydrogen atoms in the underground as water molecules, NMR enables us to obtain useful information of subsurface water. The prototype of the portable NMR scanner being developed is shown in Fig. 1. I will apply the scanner to detect the water-saturated hidden fractures in tunnels, shafts, and galleries and to estimate the fracture aperture in terms of the safe maintenance.

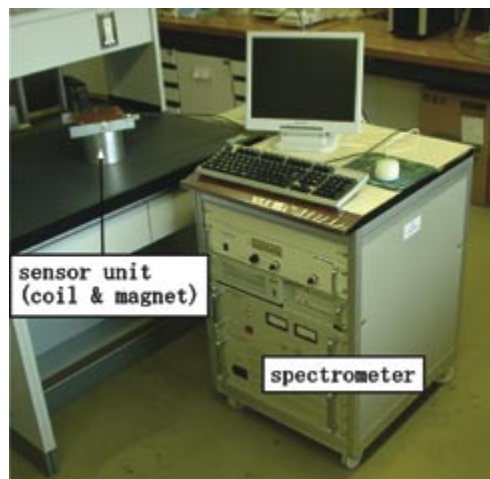


Photo of the portable NMR surface scanner