Rock physics study on Japanese geo-samples using proton nuclear magnetic resonance

Yoshito Nakashima[1]; Shin Utsuzawa[2]

[1] AIST; [2] NMR

http://staff.aist.go.jp/nakashima.yoshito/myhome.htm

The development of the method to acquire the hydrological data (e.g., porosity and permeability) of aquifers and cap rocks is needed for the CO_2 injection computer simulations. The NMR well logging provides with such hydrological data at a depth interval of several tens of centimeters. Thus, the use of the NMR logging data improves the reliability of the simulations of CO_2 injection. The accuracy/precision of the porosity and permeability values obtained by NMR logging depends on the rock species (e.g., degree of iron content). However, the accuracy/precision is not checked sufficiently for rocks/sediments in Japan. We are making a NMR apparatus for rock core samples to check the accuracy/precision. The gross feature is as follows: NeFeB magnet with 2.7 MHz Larmor frequency; CPMG pulse sequence with an echo time of 0.3 ms is available; T2 distribution (almost equivalent to the pore size distribution) can be calculated. The outline of the apparatus development and preliminary experimental data on Japanese rocks/sediments will be presented.