
Oral | Symbol M (Multidisciplinary and Interdisciplinary) | M-IS Intersection

[M-IS32_30PM1]Drilling Earth Science

Convener:*Saneatsu Saito(Japan Agency for Marine-Earth Science and Technology), Ken Ikehara(Institute of Geology and Geoinformation, National Institute of Advanced Industrial Science and Technology), Tetsuro Hirono(Department of Earth and Space Science, Graduate School of Science, Osaka University), Keita Umetsu(Japan Agency for Marine-Earth Science and Technology), Chair:Ken Ikehara(Institute of Geology and Geoinformation, National Institute of Advanced Industrial Science and Technology), Natsue Abe(Institute for Research on Earth Evolution Independent Administrative Institution Japan Agency for Marine-Earth Science and Technology)

Wed. Apr 30, 2014 2:15 PM - 4:00 PM 416 (4F)

"Earth Drilling Science" session aims to exchange the latest information and scientific achievements in Ocean/Continental drilling projects and to promote the interdisciplinary science. The session covers a wide range of drilling sciences, earth dynamics, environments, and the drilling-related technologies. The overview of the recent IODP cruises will be reported.

3:45 PM - 4:00 PM

[MIS32-P06_PG]Core quality evaluation with X-CT data

3-min talk in an oral session

*Yusuke KUBO¹, Kan AOIKE¹ (1.CDEX, JAMSTEC)

Keywords:Chikyu, IODP, X-CT, core sample

X-ray Computed Tomography (X-CT) is a powerful tool for an observation of internal structures and conditions of core samples. In the laboratory of D/V Chikyu, X-CT data has been used in initial evaluations of sample lithology, structure and physical properties such as density, before splitting the sample. In addition, the non-destructive measurement is particularly useful to evaluate the sample quality, based on which we can optimize the sampling and sample distribution plan. For example, intact pieces are passed to high-priority and contamination-sensitive analyses after observation of X-CT image. However, the evaluation of core quality has been mostly based on visual observation. While visual observation is good for quick evaluation, it sometimes lacked consistency and detailed survey. In this study we propose a quantitative way to evaluate the core quality from X-CT data. The core quality index (CQI) is calculated as the ratio of area with CT value higher than a threshold value in a sliced image of core sample. The threshold value is determined from the representative CT value in the core section and varies depending on lithology. The data in the region of interest, which is 15 cm² of central part of core sample, is binarized with the threshold value to provide normalized index through all sections. The plot of CQI reveals the position and degree of damages inside a core sample. The method is applied to X-CT data of a total of 176 sections from IODP Exp 337. The results show that CQI profile clearly differentiates intact part and disturbed part of core section. Comparison with other core quality indicators in pore water chemistry and chemical tracer experiments suggests that CQI can be used to identify intervals suitable for contamination-free sampling. The figure shows an example of binarized X-CT slice of a core sample. Red in the central part (purple) shows porous part in the core sample.