

HQR022-04

Room:201A

Time:May 24 15:00-15:15

## Evaluation of the recent activity of Kakuda-Yahiko fault based on S-wave Land Streamer reflection survey and drill core

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We have been conducting high-resolution S-wave seismic reflection surveying using Land Streamer at Akatsuka district, Niigata City. A 900-m long S-wave survey line had successfully detected off-fault deformation structure, but only a part of the main faulted zone was delineated due to short line length. We then extended the survey line to cover the main faulted zone, and added an additional 900-m long seismic line parallel to the previous line. A 75-m deep drilling survey was also appended on the line. Detailed sedimentological analysis and <sup>14</sup>C dating were applied to the drilled core. The purpose of the combined survey was to image on- and off-fault deformation structure in a flexure zone and to evaluate the recent activity of Kakuda-Yahiko Fault, which runs at the western margin of the Echigo plain.

As a result, CMP stacked migrated sections clearly profiled off-fault primary faultings as well as the major on-fault flexure structure at the near surface down to 150 m in depth. Correlation of seismic profiles with the drilled cores and logging data obtained at drill sites enabled to distinguish the recent paleoseismic events and to assess their ages and recurrence intervals. Slip rate for the delineated flexure zone was estimated about 1.4 mm/yr in a vertical component, but its fraction to the on-fault zone was at most 60 %. This indicates the conventional paleoseismic approach as typified by the combination of trenching and arrayed drilling is inadequate to understand the gross deformation of a faulted zone. In contrast, high-resolution seismic reflection surveying is capable to delineate on- and off-fault deformation structure in a faulted zone.

Keywords: concealed fault, Echigo Plain, Kakuda-Yahiko fault, Land Streamer, seismic reflection surveying, drill core analysis