KY09-09 Leg1 cruise report summary

From the very early morning of 1st November to the night of 5th November 2009, we, a Japanese and Indonesian joint research group conducted a detailed bathymetric survey using the Sea Beam 2100 multi-beam echo sounder system of R/V KAIYO in an offshore region, ranging from 300 m to 2,500 m in water depth, around a middle part of the outer-arc high off the northwest Sumatra.

The survey area was planed so as to surround the area in which we acquired another detailed bathymetry during a previous scientific cruise NT05-02 that conducted in February to March 2005. Horizontal resolution in the KY09-09 swath bathymetry was set to be approximately 30 meters for an average depth of 1,000 m. Total area covered reached approximately 3,500 km^2.

The most prominent feature in the integrated bathymetry created by KY09-09 and NT05-02 surveys is a series of ridge and trough structures trending along the arc in the direction of NNW-SSE, parallel to the strike of the Sumatra Trench. The prominent feature is possibly controlled by imbricate thrust faults. Seaward facing slopes of the ridges are generally linear and steep.

We can identify other characteristic lineament structures striking N-S and NE-SW directions. The major lineament structures, ridge and trough structures trending NNW-SSE, are occasionally offset in the N-S direction or the normal direction to the trench. These offset structures are possibly due to oblique subduction of the Indo-Australia plate.

(written by Kenji Hirata, a Leg1 co-chief scientist)