

## Dense seismic array observation in Sado island: integrated seismic survey across Niigata to eastern Yamato basin

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Formation of the fold-and-thrust belt along the eastern part of the sea of Japan and the Niigata basin was strongly controlled by the extensional crustal structure associated with the opening of the Sea of Japan. To reveal the mechanisms of the formation of the fold-and-thrust belt and zone of high strain-rate, deep seismic profiling were performed from Aizu to the eastern part of the Yamato basin in 2009. To obtain velocity profile, a dense air-gun shooting was carried out by JAMSTEC using a research vessel "Kaiyo". The capacity of air-guns was 12,000 cu. in and the shooting interval was 200 m northwest off-Sado island and 100 m in the Sado strait. In reflection seismology, shot and receiver points are exchangeable for a same seismogram. Thus, receiver gathers on Sado island, is equal to high-energy shot gathers recorded off-Sado island by dense receivers. To record the air-gun shots, off-line recorders were deployed across Sado island. We deployed 240 off-line recorders at about 100-m interval. An off-line recorder used was LS8200SD (Kurashimo et al., 2006) of Earthquake Research Institute. Waveforms were continuously recorded at a sampling rate of 125 Hz with 4.5 Hz vertical geophone. Seismic records were edited forming 70 second-long receiver gathers. High S/N ration seismograms were recorded in northern and southern mountain range of Sado island. Air-gun signals more than 150-km offset were identified in the receiver gathers obtained in Osado, northern part of Sado island. On the receiver gathers from Osado, clear reflection from Moho plane were observed at 9 to 10 second TWT at 55 km offset distance west of Sado island. On the contrary beneath Sado strait, no clear reflection from Moho-plane were identified, suggesting the difference of lower crustal architecture between east and west of Sado island. Beneath western part of Sado strait, reflectors from 7 sec TWT are identified, it is interpreted the existence of laminated lower crust. The Niigata basin, including Sado strait, has voluminous volcano-plutonic activity in Middle Miocene after the termination of volcanic activity of west of Sado island. The difference in reflectivity of lower crust in west and east of Sado island may reflect the difference in volcano-plutonic activity of both areas.