

[EJ] Evening Poster | S (Solid Earth Sciences) | S-CG Complex & General

[S-CG59] Structure and evolution of Japanese islands - Formation of island arc systems and earthquake cycles

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Subduction processes such as accretion, back-arc-spreading, and arc-arc collisions have shaped the Japanese island arc. Recent advances in seismic imaging, both passive and controlled source, have produced new images of the crust-mantle structure under Japan and surrounding regions. Through the influence of pre-existing faults and rheological structures, these crust and mantle structures are exerting strong control on active tectonic processes like seismic activity and crustal deformation in the overriding plate. We seek contributions that document and/or model the deformation of the Japanese islands over a variety of time scales from the earthquake cycle to the tectonic evolution of the Japanese island arc, and from a range of research fields including seismology, geology, geochemistry, tectonic geomorphology, and geodynamics. Multidisciplinary studies are encouraged. We also welcome contributions in numerical or analogue geodynamical modeling that explore deformation processes.

[SCG59-P08] Subduction structure around the Amami Plateau in the northern Ryukyu island-arc trench system

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In the Ryukyu (Nansei-Shoto) island arc-trench system, seismic activity is high around its back arc basin, the Okinawa Trough, island arc, and the subduction zone where the Philippine Sea plate is subducting towards the island arc. Although great ($M > 8$) interplate earthquakes have not occurred for few hundred years, various types of slow earthquake have been detected by recent seismic studies in this region. In particular, slow earthquake activity is high around the Hyuga-nada off Kyushu and the Amami Island where the Kyushu-Palau ridge and the Amami Plateau are subducting beneath the overriding plate.

To reveal the relation between the structural variation and seismic activity, we performed active source seismic surveys around the Amami Island last year just south of previous survey [Arai et al., 2017a]. We conducted a ~305km long seismic refraction profile across the northern Ryukyu Trench passing through just south of the Amami Island. 30 OBSs were deployed along the profile with interval of ~6km. A tuned airgun array of R/V Kaimei shot with a total volume of 7950 cu. in. every 100m. Multichannel seismic (MCS) reflection surveys using the 1.5km-long, 480-channel hydrophone streamer were also performed along the same line although its length is ~250km shorter for its northwestern part. Another ~135km long MCS reflection profile is set just north of the refraction profile, east off of the Amami Island.

In the both two time-migrated reflected section, the plate interface steepens very rapidly as it approaches the seafloor of the seamount/plateau, which is also reported based on the previous survey just north of this region [Arai et al., 2017a].

Based on the reflection phases from the plate interface and Moho interpreted from the OBS data, thick subducting slab recognized at just north of this region [Arai et al., 2017a] may also exist in this region.

We will show a preliminary result of first-arrival tomography based on the OBS data. Structural characteristics

in the northern Okinawa Trough will be able to be compared with those of the southern Okinawa Trough shown by Arai et al. [2017b]

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