

## Seismicity at the Kairei Hydrothermal Vent Field Near the Rodriguez Triple Junction in the Indian Ocean

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### 1. Introduction

In the first segment of the central Indian Ridge from the Rodriguez triple junction, the Kairei hydrothermal vent field exists and extrudes hydrothermal fluid with richer hydrogen content compared to other hydrothermal vents in the world. Around the Kairei hydrothermal field, serpentinized peridotite and troctolites, and gabbroic rocks were discovered. These deep-seated rocks exposed around the Kairei field may cause the enrichment of H<sub>2</sub> in the Kairei fluids. At the Kairei field, a hydrogen-based subsurface microbial ecosystem and various hydrothermal vent macrofauna were found. In the "TAIGA" Project (Trans-crustal Advection and In situ reaction of Global sub-seafloor Aquifer), this area is a representative field of "TAIGA" of hydrogen. To investigate how the deep-seated rocks (originally situated at several kilometers below seafloor) are uplifted and exposed onto seafloor, and the hydrothermal fluids circulate in subsurface, we conducted a seismic refraction/reflection survey and seismicity observation with ocean bottom seismometers (OBSs). This presentation will show seismicity of the survey area.

### 2. Observation and methods

We conducted a seismic survey around the Kairei hydrothermal field from January 27 to March 19 in 2013 using S/V Yokosuka of Jamstec (YK13-01, YK13-03). We used 21 OBSs. We determined hypocenter locations in a 3D velocity structure. The 3D structure is estimated by Takata et al. (2015, This Meeting). We used NonLinLoc software (Lomax, 2000), which can estimate earthquake locations in 3D media.

### 3. Results

From the 50 days seismicity observation, we found more than 5000 micro earthquakes in this area. A swarm of micro earthquakes exists at a location about 1-3 km northwest of the Kairei field. The swarm has a NNW-SSE strike, parallel to the ridge axis. The depth of the swarm is very shallow (~4 km from seafloor). The focal mechanisms in the swarm are normal type. These indicate that this swarm shows normal fault activity parallel to the ridge axis. This swarm may be related to the hydrothermal activities of the Kairei field. At the first segment of the central Indian Ridge, many micro earthquakes occurred. The depth of these events is about 3-6 km from seafloor, and deeper than that of the swarm near the Kairei field. The focal mechanisms at the segment are normal type with the T axis parallel to the plate motion. At the non transform offset, there are no lineaments of earthquakes and left lateral strike slip mechanisms are dominant.

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