



## **Magnetic characteristics of possible hydrothermal vents in TA 25 and TA26 seamounts, the Lau Basin**

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The deep sea three component magnetic survey was conducted in the western (site A) and eastern (site B) slopes of the caldera of TA25 seamount and the summit area of TA26 seamount, the Lau Basin, the southwestern Pacific, at Jan. 2012, using German R/V SONNE and ROV (Remotely Operated Vehicle) of ROPOS Co. The magnetic survey lines were the 29 N-S lines (TA25-East : 12 lines, TA25-West : 11 lines, TA26 : 6 lines) with about 100 m spacing and about 50 m above seafloor. For the magnetic survey, the magnetometer sensor was attached with the line frame of ROV and the data logger and motion sensor in ROV. A motion sensor (Octans) provided us the data of pitch, roll, yaw for the correction of the magnetic data to the motion of ROV. The data of the magnetometer and motion sensors and the USBL(Ultra Short Base Line) data of the position of ROV were recorded on a notebook through the optical cable of ROV. Hydrothermal fluids over Curie temperature can quickly alter or replace the iron-rich magnetic minerals, reducing the magnetic remanence of the crustal rocks, in some cases to near 0 A/m magnetization. The magnetic anomaly map of TA25 site A shows high anomalies in the central part and low anomalies in the northern part, ranging from about -500 to 500 nT. The magnetization map, calculated by the inversion of the bathymetry and the magnetic anomaly, represents low anomalous zones over the south-western part and the northern part of the area. The magnetic anomaly map of TA25 site B displays high anomalies in the southeastern part and low anomalies in the central and eastern parts, ranging from about -700 to 800 nT. The low magnetization zones occur over the western part and central part of the area. The high magnetic anomalies of the survey area of TA26 are located in the north and northeastern parts and low anomalies in the southeastern part, with the magnetic anomaly range from about -2000 to 1600 nT. The magnetization map shows east-west trend low anomalous zones in the area. The low anomalous magnetization zones of the survey areas usually appear in groups. Some of these low magnetization zones are well matched with the chimney sites or hydrothermal altered areas, based on the previous results of video or rock sampling. The low magnetization zones are likely to be the possible hydrothermal vents.