Recent earthquake activities in the Southwestern Ryukyu arc eastern Taiwan region

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Geology and tectonics of the region between the southwestern Ryukyu arc and the eastern Taiwan are characterized by subduction or collision of the Philippine Sea plate and Eurasian plate. The present collision boundary in Taiwan is located along the Longitudinal Valley between Hualien and Taitung, but the plate boundary of the region between the northeast off Taiwan and the southwestern Ryukyu arc is not yet clear and still controversial. In order to make clear the plate boundary or configuration and tectonics in the region, it is indispensable to study the accurate seismic activities, in other words, precise hypocenter distributions, focal mechanisms, and so on. So we have extended the seismic station network into the eastern Taiwan since September 1998. At the present time 13 stations are operated in total, including 7 stations in Iriomote Is. and Ishigaki Is., and 3 stations (Ilan, Hualien and Taitung) in the eastern Taiwan. The 5 stations out of them (Ilan, Hualien, Taitung, Yonaguni Is. and Iriomote Is.) are installed 3-component telemetering systems, and then we can monitor the seismic activities in this region by the semi-realtime mode. We, therefore, have been able to obtain more accurate or detailed hypocenter distributions in this region. As the results, our hypocenter locations show a large discrepancy with those of Japan Meteorological Agency and Taiwan Central Weather Bureau, which may be due to biased station networks, complex lithospheric structures and others, in this area. Recently, within a half year, four large earthquakes occurred near Yonaguni Is. (Dec. 18 2001, M7.3), near Ishigaki Is. (Mar. 15 2002, M6.6), and off east coast of Taiwan (Mar. 31 2002, M7.2, and May 15 2002, M6.8). These earhtquake focal zones seem to align along the plate boundary, and their focal mechanisms are reflected on a complicated tectonics in the region. We describe the precise hypocentral distribution, and fault plane model of earthquake. Also we make consideration about the cause of the activity and the tectonics.