Spatiotemporal distribution of regular and very low-frequency earthquakes in the northern part of the Ryukyu subduction zone

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We have investigated detailed spatiotemporal distribution of regular and very low-frequency (VLF) earthquakes including an Mw 6.3 interplate event near Tanegashima along the Ryukyu trench on Jun. 08, 2019. This earthquake was followed four Mw4-5 class regular and many VLF earthquakes by the end of Jan., 2019. At first we estimated centroid moment tensors of these regular and several VLF earthquakes, respectively, from broadband seismograms recorded at the NIED F-net and temporally observation stations. In the next step, the known VLF earthquakes were selected to be template events for searching unknown VLF earthquakes from continuous seismograms. If there are several candidates of VLF earth quake, we select the most coherent event with a maximum cross-correlation coefficient averaged over all stations in every 180 seconds. Finally we estimated locations of the selected events from phase shift of the wavelets between the template and these selected events. Obtained result shows that activity of VLF earthquakes after the Mw 6.3 earthquake was started in the adjacent area east of this Mw 6.3 earthquake; however, the following Mw4-5 regular earthquakes occurred south of this area in the period of Jan. 25-30, 2019. In this period, the front of the VLF activity migrated toward east from these Mw4-5 events. Such a spatiotemporal distribution of regular and VLF earthquakes suggests that the after slip of the Mw 6.3 and/or an SSE caused these regular and VLF earthquakes.