

## Initial development of the Matsushiro Earthquake Swarm and Influence of Tidal Strain on its Occurrence, the 2nd Report

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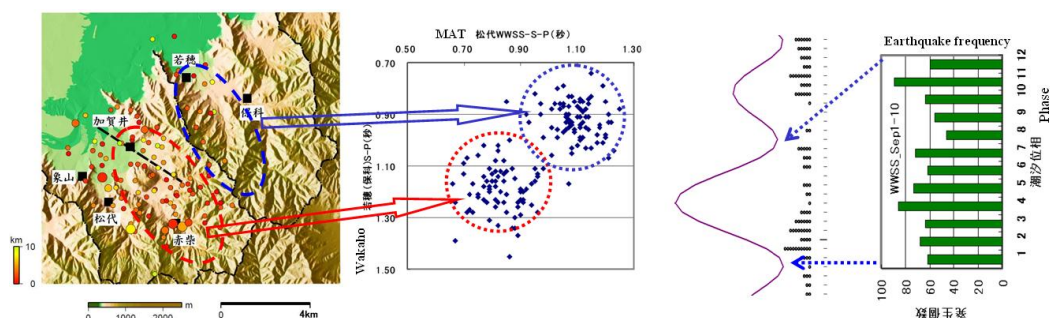
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Initial development of the Matsushiro earthquake swarm that started in early August of 1965 was investigated in detail by analyzing seismograms of Akashiba and Wakaho, temporarily operated stations of JMA, and we found that the initial stage of the swarm consists of two phases. In the initial stage, the swarm occurred in a small area north of the estimated Matsushiro earthquake fault and a month later in the next stage, a new activity occurred in a wider area south of the fault. To make the result more clear, we re-investigated WWSS-SP seismograms of Matsushiro(MAT) station. S-P times were picked from three component seismograms and averaged for each event to obtain a precision of about 1/20s. The new data and existing data suggested that a transition from the first phase to the second phase of the activity occurred rapidly in early September and S-P histograms of each station and comparison of them indicate that the northern area of the initial phase and the southern area of the second phase are defined and separated in each other clearly.

To relate the areas of the swarm in the initial stage to the geography, we studied hypocenters in October and November of 1965 after deployment of temporal seismic station network of the Earthquake Research Institute(ERI) and incorporated 6 stations data of JMA and ERI into hypocenter location. Preliminary location suggests that hypocenter distribution well correspond to the areas of initial development of the swarm.

We analyzed relation between tidal strain changes and earthquake swarm occurrence.

Among several tidal strain components, weak relation between volume, aerial tidal strains and occurrence of the swarm earthquake were found. In the first stage in 1965 August, earthquakes seemed to be occurring during tidal volume strain was in contraction stage and in the next stage in September, many earthquakes were occurring during tidal volume strain in dilatational phase. Volume strain may be related to the change in pore pressure and affected the occurrence of earthquake.



Hypocenters and comparison of S-P times for the initial stage of the Matsushiro Earthquake swarm (in the blue circles) and those in the second stage (in the red circles)

Volume tidal strain change and Earthquake Occurrence

Keywords: Matsushiro Earthquake Swarm, Tidal Strain, Pore Pressure