Unknown later arrivals in controlled source seismograms in northern Kagoshima Bay region.

*Tomoki Tsutsui[1], Takeshi Tameguri[2], Masato Iguchi[2], Haruhisa Nakamichi[2]

1.Akita University, 2.Kyoto University

We will present unknown later arrivals in the controlled source seismograms which detected in northern Kagoshima Bay area, and will discuss their origin and structure in the area.

Project Sakurajima 2008 had been conducted with chemical explosion for the sake of exploring magma system and its background structure on November 2008 (Iguchi et al., 2009). A dataset of first arrival time has been analyzed down to 4km below sea level by Miyamachi et al. (2013) and Tameguri et al. (2012). They presented that velocity is lower inside of Aira Caldera than that of outside.

On the other hand, the seismograms also include following two prominent later arrivals which have never been discussed;

1. The phase arrives on 7 to 8 seconds over the stations in south Sakurajima through Osumi Peninsula,
2. The phase arrives on 8 seconds over the stations in Shirahama through Uranomae in north eastern Sakurajima.

The arrival 1 appears definitely clear in southeast shore of Sakurajima. Its apparent velocity is just above 7 km/s and then is asymptotically closing that of the first arrival. The similar later arrival appears in other seismograms across the same region of the midpoints. The arrival 2 appears definitely clear at Wariishizaki point, north shore of Sakurajima. Its apparent velocity is over 8 km/s. No similar arrival appears in any seismograms across the same region of the midpoints.

Considering those characteristics of each arrival, the arrival 1 is interpreted as PP reflection and the arrival 2 as PS conversion. Then, assuming wave types, interface model for the reflection and the conversion have been considered, which can explain their travel time better. An interface at 11 km below sea level appears better fit with both of their travel times. Moreover, the mid points and the estimated converted points coincide with each other at the central area of northern Kagoshima Bay. The reflection and the conversion occur at the same interface because of the model and their identical apparent velocity.

The central area of northern Kagoshima Bay involves inflation sources beneath, which have been presented by Mogi (1958); Yokoyama (1971); Eto et al. (1997); Yamamoto et al. (2013); and Iguchi et al. (2013). The interface coincides with those inflation sources. It is of interest that the interface at the center of northern Kagoshima Bay can associate with possible deep magma reservoir which feeds magma to Sakurajima Volcano.

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