Comparison between active fault structure by time-reversal method and beachball

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Recently, authors constructed a dynamic model of an active fault based on time reversal principle of wave propagation. Then, it is shown that the beachball and the dynamic model are compared, and the azimuth of the obtained active fault was mutually corresponding. Dynamic model is constructed based on the time reversal principle of wave propagation. The P wave components of a seismic wave received at an observation point is cut out, and the wave is reversed timewise. The reversed signal is radiated on a propagation simulation, and the pulse formed at the source location, that is, time reversal pulse (TRP) is obtained. It is described as an example of the dynamic model for the earthquake that occurred in the central part of Suruga Bay in August, 2009. The clear orientation dependency existed in obtained TRPs. The frequency spectrum has changed greatly depending on the azimuth. The maximum amplitude frequency rises greatly as the azimuth moves from west to east and it has descended.
It is thought that the frequency rise in this case is done by a local speed mobile of a pressure source. The moving direction concentrated to Nishiizunishi, Kawazu, and Ito. The P waves received by these stations had a peculiar waveform. The head part of the received wave at Nishiizunishi has expanded. However, the received waves at Ito and Kawazu near Nishiizunishi ware usual waveforms. The head's growing in this manner occurs when the progression speed of a crack in an active fault becomes near the velocity of propagation. The pressure that occurs due to a crack is added cumulatively along with the speed mobile of the crack. That is, it is thought that a parametric effect was caused.
Nishiizunishi is the specific point that reflects the feature of this earthquake. The point where the narrow beam radiated from an active fault appears at surface of the earth is named a parametric spot (PS). The head of the pulse to which the head part observed at the PS expands is named a parametric head. The azimuth of the narrow beam radiated from an active fault is the azimuth of an active fault. Therefore, the azimuth of the PS is the azimuth of an active fault. The azimuth of the parametric spot of this earthquake is 86°. On the other hand, the azimuth by the beachball that the Meteorological Agency obtained is 71°. They are almost corresponding.
From the above studies, the dynamic model based on the time-reversal method is effective for the clarification of the quake characteristic of the active fault.

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