We estimate the potential radiation region of the second wave packet observed in the high-frequency waveforms at near-fault stations (Fig. 5c). We use the arrival times of the second wave packet shown in the horizontal high-frequency envelope at the near-fault stations (Fig. 5d). We square the high-frequency velocity waveforms in Fig. 5c, calculate vector summations of the horizontal components, smooth them using a Hanning window applied 400 times, and multiply them by a mass density of 2,500 kg/m$^3$. The envelopes calculated in this way have the dimension of energy density (J/m$^3$). Hereafter, we use the envelopes at TTR005 and OKYH10 because the envelope peak corresponding to the second wave packet is obscure at TTRH07. First, we determine the peak time of the envelope at TTR005, $T_p^{TTR005}$ (red line at TTR005 in Fig. 5c). This peak corresponds to the second wave packet at TTR005. In this analysis,
$T_{p}^{TTR005}$ is regarded as the arrival time of the second wave packet at TTR005. Given
that the second wave packet radiates from point $\xi$ on fault as direct S-wave, the
radiation time of the second wave packet at point $\xi$, $T_r(\xi)$, is obtained using the
following equation:

$$T_r(\xi) = T_{p}^{TTR005} - t_{TTR005}(\xi)$$ \hspace{1cm} (1)

where $t_{TTR005}(\xi)$ is the theoretical travel time of direct S-wave from $\xi$ to TTR005.

The arrival time of the second wave packet at OKYH10 from $\xi$, $T_{a}^{OKYH10}(\xi)$, is
obtained using the following equation:

$$T_{a}^{OKYH10}(\xi) = T_r(\xi) + t_{OKYH10}^{\xi}$$ \hspace{1cm} (2)

where $t_{OKYH10}^{\xi}$ is the theoretical travel time of direct S-wave from $\xi$ to OKYH10.

Substituting Eq. (1) into Eq. (2) gives

$$T_{a}^{OKYH10}(\xi) = T_{p}^{TTR005} - t_{TTR005}(\xi) + t_{OKYH10}^{\xi}.$$ \hspace{1cm} (3)

Using Eq. (3), we calculate $T_{a}^{OKYH10}(\xi)$ on the whole of the fault. This fault is
equivalent to the assumed one in the source inversion. Finally, as the possible radiation
region of the second wave packet, we extract fault point $\xi$ where $T_{a}^{OKYH10}(\xi)$ falls
within the time range of the second wave packet. The time range of the second wave
packet at OKYH10 is the cyan region in the envelope at OKHY10 in Fig. 5d, which corresponds to the second wave packet at this station. The region of the extracted points is shown by cyan shade in Fig. 5a. This region is located in the north side of the fault and it overlaps R2 in our source model. In the envelope at TTRH07 in Fig. 5d, the expected range of arrival time from the radiation region of the second wave packet is drawn in light purple, and it corresponds to the later peaks of the envelope.