Spatial distribution of long-term slow slip events beneath the Bungo Channel under sparsity constraints (II)

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We estimated spatial distribution of the long-term slow slip events (L-SSEs) beneath the Bungo channel in southwest Japan from 1996.7 to 1998.5, 2001.9 to 2004.5, and 2009.5 to 2011.2. The total slip distributions of these L-SSEs estimated by geodetic data have been smoothed to some extent due to prior constraints on inversion analyses. In this study, we have applied an inversion method called fused regularization, a type of sparsity constraint, suitable for detecting discontinuous changes in the model parameters, for evaluation function. As a result, we found that the largest slip abruptly becomes zero at the down-dip limit of the seismogenic zone, and is immediately reduced to half at the up-dip limit of the deep low-frequency tremors, and becomes zero near its down-dip limit.
Such along-dip correspondences imply that some thresholds exist in the generation processes for both tremors and SSEs. These findings will help to reveal the transition mechanism from megathrust earthquakes to slow earthquakes on the subducting plate interface. Now, we are analyzing additional data from 2014.0 to 2017.0. In the tentative results, the slip distribution on the 2014 event was deeper than that of the 2016 event as suggested by Ozawa [2017]. The slip distribution on the 2016 event was almost the same area as those on 1997, 2003, and 2010 events. In the presentation, we will also show results using observation data from 2014.0 to 2017.0.

