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

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It is possible that generation mechanisms of slow earthquakes are affected by certain physical and/or chemical thresholds. However, up-dip and down-dip limits of long-term slow slip events have previously been assumed to be smoothly distributed because of prior constraints to inversion analyses. We have applied an inversion method called generalized fused lasso, a type of sparsity constraint, for evaluation function. We analyzed realistic displacement data for long-term slow slip events (L-SSEs) observed at GEONET stations around the Bungo Channel, southwest Japan. Using fused regularization, we estimated the slip distribution of three L-SSEs that occurred on 1997, 2003, and 2010. As a result, we identified three discontinuous boundaries on the subducting plate interface. These findings will help to reveal the transition mechanism from megathrust earthquakes to slow earthquakes on the subducting plate interface.