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Earthquake prediction based on spatially stable clusters of alarms

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A new scheme, named M8S, for the spatial stabilization of the intermediate-term middle-range predictions made by the M8 algorithm has been proposed recently. The essence of the M8S algorithm is the multiple application of M8 in a large number of objectively distributed circles of investigation aimed at elimination of spatially sporadic alarms. Originally, the scheme has been designed, developed and tested successfully in retrospective prediction of moderate earthquakes in Italy and California. Here we demonstrate the performance of the M8S algorithm in application aimed at prediction of the world largest earthquakes in Circum Pacific. The experiment enables us (i) to confirm high spatial stability of the predictions made in the framework of the on-going Global Test of the M8 algorithm and (ii) to guarantee a more reliable diagnosis of times of increased probability for the world largest earthquakes. Compared to the original application of M8 in the Global Test, the spatially stabilized predictions reduce the total volume of alarm, measured by distributed seismic activity multiplied by uniform time, from 35% to about 20%.