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Application of real-time tsunami prediction system using oceanfloor network system for the inland sea areas

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We have developed the tsunami prediction system using dense oceanfloor network system for earthquakes and tsunamis (DONET), and implemented it on some local governments and an infrastructure company. To confirm the expandability, we considered implementation of the prediction system for inland sea “Setonaikai” areas. The inland areas have much islands including relative large one. Therefore, there are many propagation paths of the tsunami and many reflections from islands and interaction between them are expected. We calculated tsunami waveforms of the inland areas using a M9 model, and confirm the process of the tsunami propagation from source to an inland area city through very narrow strait. The tsunami is amplified by interactions between islands after tsunami reflects from near small bays. The highest tsunami is not always first tsunami but the second or the third. The tsunami prediction system has the maximum tsunami height for each target point in the database, therefore, the timing of the highest tsunami should be confirmed in advance. In addition, diversity of the tsunami propagation could be one of issues to apply the prediction system. Because the tsunami may have various frequency and the character of the attenuation might be different. We used fault models of 1506 cases changing the source depth, the dip, and the magnitude in the database of the prediction system, and compared among each tsunami waveform at a target points for the prediction. As the results, the frequency of the tsunami propagating through a narrow strait is relatively uniform regardless of changing parameters like the source depth, the dip and the magnitude. It means that there is almost no diversity after pass through DONET observatories. The homogeneity among each tsunami waveform is helpful for use of the prediction system.