

**BEACH PROCESSES IN RIVER MOUTH  
and  
Diffusion and Dispersion Model in Rocky Coast**

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Summary

In Asian coastal region, we have many problems for the maintenance of waterway which connects big river port with open ocean. The examples are Chao Phraya river in Thailand or Mekong river in Vietnam. In the present paper, sedimentation and beach processes will be considered in river mouth area in order to minimize maintenance costs for these large rivers. A new numerical model is proposed for the simulation of beach processes in this area under waves, wave induced current and river discharges. Laboratory experiments under oblique incident waves are also performed to understand the physical mechanism of sediment transport and the results are used to examine the numerical model. For the application, the model is used to predict diffusion and dispersion process in rocky coast in order to calculate supply of mineral source such as Fe complex, from land to coast bottom.

A numerical model is developed to predict diffusion and dispersion process in rocky coast. The wave field is calculated by using mild slope equation with including wave-current interaction effect. Near-bottom velocity variations and the distribution of radiation stress are evaluated by using the calculated wave field. The current field associated with sand movement is calculated including wave induced current and river discharge. Since we included wave-current interaction, it was necessary to calculate by iteration process in order to get converged solutions for wave and current field.

The distribution of sediment concentration and steady current is newly included in the model. The wave field, current field and concentration field are compared with field condition in Hokkaido coast in order to examine the validity of numerical model.

From numerical calculation, it is observed that supplied mineral source attached to sediment is deposited in the area where the depth is less than 1 m and the area close to the shoreline. From the results, we can judge that the present numerical model, which includes wave-current interaction, wave breaking over rocky coast, predicts location of supply of necessary minerals for sea weeds in the vicinity of rocky coast line.