Application to the coastal plain research of the ground penetrating radar

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We have developed the technique for GPR (Ground Penetrating Radar) field survey and the data processing method of GPR reflection signal to image the subsurface sedimentary structure of coastal plain combining GPR with a boring method. We surveyed the Kujukuri strand plain and the Sendai plain (a wave dominated type), the Yumigahama Peninsula (a large regressive barrier type), the Miho Peninsula (a sand spit type), and the Nemuro Peninsula for Tsunami sediment.

Our GPR system is pulse EKKO 100 with the unshielded type antennae manufactured by Sensors & Software Inc. of Canada. The antennae are excellent in the mobility because antennae weight is light, but often takes the influence of the outside noise. We have improved the techniques to make efficient field survey and developed the data processing method to obtain GPR reflection profile in which interpretation is as easy as possible.

The Kujukuri strand plain has been formed by shoreline regression with a decrease in sea level since about 6000 years ago. The GPR survey was carried out around the existent boring site here. Beach sediment (2300-2200 cal yr B.P.) was obtained in the boring core around the GPR site. The result, which was obtained in about 3 km inland area, is shown as an example. The stratigraphy in the GPR profile is divided into three units which are correlated with a backshore facies, a foreshore facies and a upper-shoreface facies in the boring core. The boundary between the foreshore facies and the upper shoreface facies, which is correlated with sea surface in the stage, is located at around the elevation 0m. The elevation of the boundary rises in the inland direction, indicating that the sea level was high in the past age.