Study on the maximum amplitude level of strong ground motion observed at seafloor

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To make a better understanding about the site amplification effects at the ocean bottom, we examined the strong motion records from three ocean-bottom seismic networks. The submarine cable data at off Tokachi-Kushiro and off Muroto cape operated by the JAMSTEC are targeted as well as such a cable data at Sagami Bay by the NIED. The ocean-bottom seismographs at off Tokachi-Kushiro successfully recorded the near-field ground shaking during the 2003 Off Tokachi earthquake (M_J7.9): the maximum acceleration of the horizontal components from three stations was 842cm/s^2, 616 cm/s^2, and 431 cm/s^2. The ocean-bottom seismographs at off Muroto Cape recorded the strong motion data during the foreshock (M_J6.9), the mainshock (M_J7.4), and the largest aftershock (M_J6.4) of the 2004 Off Kii Peninsula earthquake: the maximum acceleration for the mainshock was about 10 cm/s^2 at two stations. The ocean-bottom seismographs at Sagami Bay recorded small earthquakes (ranging from M_J4.0 to 6.4) around Izu Peninsula and the intermediate deep earthquakes beneath the Kanto area: the maximum acceleration was higher than 200 cm/s^2 at five stations, and the highest data was 419 cm/s^2 at the KNG205. The maximum acceleration data from each cable network was compared with those from the K-NET stations as well as the calculated values based on the regression analysis results. Several findings are summarized as follows: (1) for observation at off Tokachi-Kushiro, the seafloor data showed a good agreement with calculated values as those from the K-NET stations did, (2) for observation at off Muroto Cape, the seafloor data showed relatively small amplitude rather than calculated values, whereas those from the K-NET stations did preferable matching with the predicted values, (3) for observation at Sagami Bay, the seafloor data significantly exceeded calculated values in most earthquakes, nevertheless those from the nearby K-NET stations showed the reasonable amplitude. To comprehend the site effects in details, thorough investigations should be done focusing on the maximum velocity and frequency characteristics. Finally, we used the data of the K-NET operated by the NIED. Our sincere gratitude is given to whom it may concern.