

## Tidal Harmonic Analysis of Two-Year Seafloor and Formation Pressure Records from the LTBMS in Hole C0006G at the Nankai Accretionary Prism Toe

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We will report results of tidal harmonic analysis of the seafloor and formation pressure records from the Long-Term Borehole Monitoring System (LTBMS) installed in Hole C0006G in January-February 2018 during IODP Expedition 380. This LTBMS is the most recent and most seaward of three installed to date by D/V Chikyu along the NanTroSEIZE Transect. Hole C0006G penetrates into the toe of the accretionary prism ~2 km landward from the deformation front at the plate boundary. The installation includes a reference seafloor pressure gauge at 3868 m water depth, and a formation gauge connected by hydraulic tubing to a sampling screen at 453.5 m below seafloor or about half-way between seafloor and the plate boundary fault at this location. The LTBMS instruments were hooked up to the DONET seafloor cabled observatory at the end of March 2018, and pressure data sampled at nominal 1-second intervals since then have been logged onto the JAMSTEC J-SEIS database. As of the submission of this abstract, we had performed initial harmonic analyses on month-long records from seven months spaced through the ~2 years of available data: April 2018, July 2018, October 2018, April 2019, July 2019, October 2019, and January 2020. For the purpose of these initial harmonic analyses, we downsampled the data at 5- or 1-minute intervals. The results from five months (April 2018, July 2018, October 2018, July 2019, and October 2019) show consistent amplitudes and phase relationships for each of the five main tidal constituents with the highest signal levels: M2, S2, O1, K1, and N2. The formation to seafloor amplitude ratios average closely around 0.73 and phase differences are small, averaging less than 1°. This hints at very little temporal change in the formation properties over the two-year recording period. The pressure records from April 2019 and January 2020 included significant multi-day gaps apparently due to DONET network maintenance; as a result, the tidal harmonic analyses for those incomplete records were less robust and somewhat inconsistent. At the JpGU meeting, we will report the results of the harmonic analysis on all of the data from April 2018 through April 2020, not just at monthly intervals, but also at longer intervals such as 43 or 59 days that may provide better resolution of the tidal behavior, especially where there are significant data gaps. We will also describe any transients evident in the formation pressures that might be associated with any changes in the tidal responses.