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[Volume 11, Issue 3 \(March 1981\)](#)

Journal of Physical Oceanography

Article: pp. 394–409 | [Abstract](#) | [PDF \(1.11M\)](#)

Bottom Pressure and Sea Level Measurements in the Gulf of Lions

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(Manuscript received March 4, 1980, in final form December 12, 1980)

DOI: 10.1175/1520-0485(1981)011<0394:BPASLM>2.0.CO;2

ABSTRACT

Bottom and atmospheric pressure, sea level, wind, current and temperature measurements have been obtained during summer in the coastal zone of the Gulf of Lions. Relations between these parameters are estimated mainly with coherence analysis. First, it is shown that the atmospheric pressure forcing is small and that the sea level and bottom pressure spectra are very similar. Then the characteristics of tides are computed with a least-squares method. Removing the tidal signal from the original time series allows us to study in a clearer way the inertial frequency band: arguments for the possible occurrence of sea surface oscillations at this frequency are discussed. At lower frequencies, large sea level variations are due to the wind. At frequencies higher than the tidal ones, very energetic signals are connected with natural oscillations of the Gulf of Lions induced by atmospheric pressure perturbations of a relatively small scale. This paper is concerned with regional oceanography, but the results (mainly those about natural oscillations) corroborate the interest of filtering in the frequency domain.

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