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Bottom pressure observations in the Gulf of Mexico and Caribbean Sea

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Abstract

During 1971 to 1974, offshore pressure gages were developed in the Gulf of Mexico and the Caribbean Sea to measure tides and bottom pressure continuum. The observations indicate that the Gulf of Mexico has a Helmholtz resonance with a period of 1.56d. While the lack of confidence limits on theoretical cotidal charts hinders the comparison between theory and observation, the latter tend to support a model with direct astronomical forcing. The observations in the Caribbean Sea verify the general features of theoretical cotidal charts. At a six-month long station in the Eastern Caribbean, bottom pressure fluctuations with 4 to 5-d period are coherent and in phase with atmospheric waves in the Easterlies. The inverse barometer compensation appeared to be less complete in this semi-enclosed sea, spanned by weather systems, than in the open ocean. An appendix gives corrections to the response method of tidal analysis, the procedure for converting the results to harmonic constants with error estimates, and



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