



Enhancement of a Sea-floor gravity-meter to be used in the multiparameter sea bottom observatory, for long time acquisition.

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A gravity-meter for geophysical measurements of long duration on board a multiparameter sea-floor observatory has been developed in the framework of the project GEOSTAR (GEophysical and Oceanographic Station for Abyssal Research). The instrument has been used in several missions, demonstrating high sensitivity (10^{-9} g/ $\sqrt{\text{Hz}}$), low power dissipation ($<300\text{mW}$) and reduced volume and weight. The instrument is not thermally stabilized and its best performance are obtained at a depth $>3000\text{m}$, where the temperature is quite stable. The need to operate also at lower depth, in presence of higher temperature variations, forced us to implement a new prototype with same performances of the previous version but with reduced temperature sensitivity. These performances are obtained suspending the proof mass electrostatically via a resonator circuit biased at a frequency higher than its resonance frequency, to compensate the gravity force and simultaneously to maintain a good signal-noise ratio. A detailed description of the prototype is given and the experimental results are presented.