

## Compact Tiltmeter with Folded Pendulum

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We propose the new design of a compact tiltmeter that is suitable for array observations at extreme region such as deep ocean floor boreholes. The main features of the design are a compact low frequency folded pendulum (FP), optical readout/power supply, and separated location of the power source/consumer and the passive element.

FP is a conventional technique to realize low frequency horizontal suspension, and the achievable lowest resonance frequency is practically determined by the residual elasticity of the flex joints (i.e. hinges). To obtain appropriate natural frequency ( $\sim 500$  mHz) in a reasonable size of the instrument ( $< 5$  cm cube), we utilize the state-of-the-art micro machining techniques. The position of the FP mass will be detected by an optical lever, or similar simple optical readout which sensor head is composed only by optical fibers. The electric current needed for position control of the FP is provided by a few solar cells which will be energized by the light delivered through optical fibers.

The light sources and electronic components for optical detection and other control purposes are located far enough from the FP, preferably at the place where one can easily approach for maintenance purpose.