OAK RIDGE NATIONAL LABORATORY
Managed by UT-Battelle for the Department of Energy

Nanomechanical Electric and Electromagnetic Field Sensors

Disclosure Number

201002376

Technology Summary

The invention relates to the use of micro/nano-mechanical oscillators to detect electric and electromagnetic fields. Time varying electric field sensing is usually achieved using an antenna and receiver. An important aspect of the invention is that, in contrast to traditional antennas, the dimensions of these nanomechanical oscillators are much smaller than the wavelength of the electromagnetic wave. In our invention, the detection of static electric fields and/or time varying electric fields (electromagnetic waves) is based on the detection of the force on electrically charged nanomechanical oscillators. In order to achieve both high dynamic range and wide spectral response, the cantilever operating frequency is tunable.

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