NiPS Laboratory
Noise in Physical Systems

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Department of Physics, University of Perugia – I-06100 Perugia, Italy

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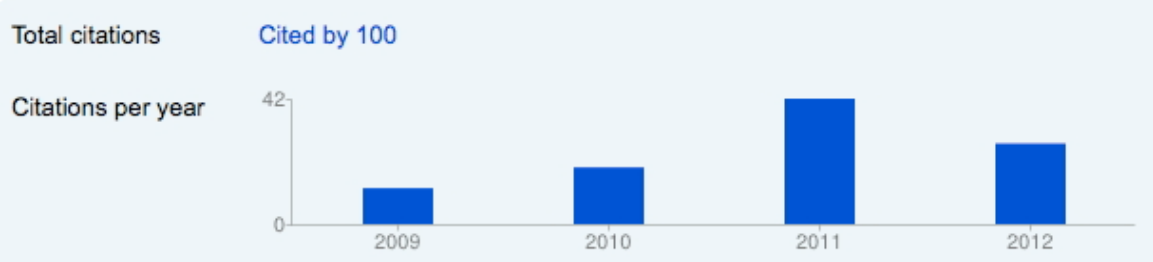
NiPS pioneering paper "Nonlinear Energy Harvesting" reached 100 citations…

The paper from NiPS entitled "Nonlinear Energy Harvesting", published on Physical Review Letters in 2009 has reached 100 citations on Google Scholar.

It is an important result for NiPS because this paper was the first ever published where the NiPS scientists showed that "nonlinearity can help" in improving the performances of a vibration energy harvesting. Before this paper the common approach to vibration energy harvesting was confined to linear (i.e. resonant) oscillators.

See 100 citations on Google Scholar here

For a review article on nonlinear vibration energy harvesting please see: There's plenty of energy at the bottom (micro and nano scale nonlinear noise harvesting), Gammaitoni, L. , Contemporary Physics, p.1-17, (2012).



total citations at Sept 6, 2012

Nonlinear Energy Harvesting
Francesco Cottone; Helios Vocca; L. Gammaitoni, Phys. Rev. Lett., Volume 102, Issue 080601 (2009)

http://link.aps.org/doi/10.1103/PhysRevLett.102.080601

Abstract:
Ambient energy harvesting has been in recent years the recurring object of a number of research efforts aimed at providing an autonomous solution to the powering of small-scale electronic mobile devices. Among the different solutions, vibration energy harvesting has played a major role due to the almost universal presence of mechanical vibrations. Here we propose a new method based on the exploitation of the dynamical features of stochastic nonlinear oscillators. Such a method is shown to outperform standard linear oscillators and to overcome some of the most severe limitations of present approaches. We demonstrate the superior performances of this method by applying it to piezoelectric energy harvesting from ambient vibration.

Communication office NiPS Laboratory
www.nipslab.org
T. +390755852733, F. 0755848458 M.+393477030377, e-mail comunicazione@nipslab.org