



吉首大学学报自然科学版 » 2010, Vol. 31 » Issue (4): 71-75 DOI:

物理与电子

[最新目录](#) | [下期目录](#) | [过刊浏览](#) | [高级检索](#)

[« Previous Articles](#) | [Next Articles »](#)

由随机振动所驱动的纳米发电机 ——从无序中提炼出有序

(吉首大学物理科学与信息工程学院, 湖南 吉首 416000)

Nano-generator Driven by Stochastic Vibrations——Refining Order from Disorder

(College of Physics Science and Information Engineering,Jishou University,Jishou 416000,Hunan China)

- [摘要](#)
- [参考文献](#)
- [相关文章](#)

全文: [PDF \(199 KB\)](#) [HTML \(1 KB\)](#) 输出: [BibTeX](#) | [EndNote \(RIS\)](#) [青景资料](#)

摘要 研究了由超声波驱动的直流纳米发电机的发电原理,该发电机是一个无序能量收集器,能把纳米尺度的无规则或无序的微小机械能转变成有序的电,即该纳米发电机是一个能把混乱整理成秩序、能从无序中提炼出有序的装置.计算了随机振动噪声所引起的纳米发电机输出的直流电流大小,在一定的条件下,这种纳米发电机的输出电流大小可以达到240 nA且可以由实验来测量的.

关键词: 纳米发电机 随机振动 无序能量收集器

Abstract: The principle of the direct-current nano-generator driven by ultrasonic waves is studied.It is shown that the nanogenerator is a wonderful disorder-energy harvester,it can convert nanoscale random minor mechanical energy into electrical energy;in other words,it is a wonderful device that can convert mess into order and refine order from disorder.The direct-current value of the nano-generator caused by stochastic vibrations noise is also calculated.Under certain conditions,the direct-current value of the nanogenerator can achieve the level of 240 nA,which can be measured by experiment.

Key words: nano-generator stochastic vibration disorder-energy harvester

基金资助:

吉首大学研究生处资助项目

作者简介: 李德俊 (1956-),男,湖南澧县人,吉首大学物理科学与信息工程学院教授,硕士,主要从事凝聚态物理研究.

引用本文:

李德俊.由随机振动所驱动的纳米发电机 ——从无序中提炼出有序[J].吉首大学学报自然科学版,2010,31(4):71-75.

LI De-Jun. Nano-generator Driven by Stochastic Vibrations——Refining Order from Disorder[J]. Journal of Jishou University (Natural Sciences Edit, 2010, 31 (4): 71-75.

[1] JAVEY A, GUO J, WANG Q, et al. Ballistic Carbon Nanotube Field-Effect Transistors [J]. Nature, 2003, 424: 654-657.

[2] LI Y, QIAN F, XIANG J, et al. Nanowire Electronic and Optoelectronic Devices [J]. Mater. Today, 2006, 9: 18-27.

[3] TIAN B. Coaxial Silicon Nanowires as Solar Cells and Nanoelectronic Power Sources [J]. Nature, 2007, 449: 885-890.

[4] PARADISO J A, STARNER T. Energy Scavenging for Mobile and Wireless Electronics [J]. Pervasive Comput, 2005 (4): 18-27.

[5] WANG Z L, SONG J H. Piezoelectric Nanogenerators Based on Zinc Oxide Nanowire Arrays [J]. Science, 2006, 312(5 771): 242-246.

[6] WANG X D, SONG J H, LIU J, et al. Direct-Current Nanogenerator Driven by Ultrasonic Waves [J]. Science, 2007, 316(5 821): 102-105.

[7] WANG X D, LIU J, SONG J H, et al. Intergrated Nanogenerators in Biofluid [J]. Nano Lett., 2007 (7) : 2 475-2 479.

[8] QIN Y, WANG X D, WANG Z L. Microfibre-Nanowire Hybrid Structure for Energy Scavenging [J]. Nature, 2008, 451: 809-813.

[9] GAO Y F, WANG Z L. Electrostatic Potential in a Bent Piezoelectric Nanowire [J]. Nano Lett., 2007, 7: 2 499-2 505.

服务

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [E-mail Alert](#)
- ▶ [RSS](#)

作者相关文章

- ▶ [李德俊](#)

没有找到本文相关文献

版权所有 © 2012《吉首大学学报（自然科学版）》编辑部

通讯地址：湖南省吉首市人民南路120号《吉首大学学报》编辑部 邮编：416000

电话传真：0743-8563684 E-mail：xb8563684@163.com 办公QQ：1944107525

本系统由北京玛格泰克科技发展有限公司设计开发 技术支持：support@magtech.com.cn