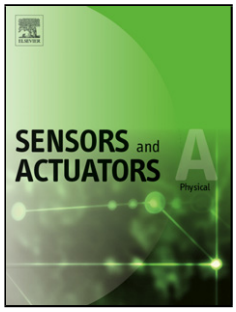

Title: Electret-Material Enhanced Triboelectric Energy Harvesting from Air Flow for Self-Powered Wireless Temperature Sensor Network

Authors: Yingchun Wu, Yushen Hu, Ziyu Huang, Chengkuo Lee, Fei Wang

PII: S0924-4247(17)31704-1
DOI: https://doi.org/10.1016/j.sna.2017.12.067
Reference: SNA 10554

To appear in: *Sensors and Actuators A*

Received date: 25-9-2017
Revised date: 30-12-2017
Accepted date: 30-12-2017

Please cite this article as: Wu Y, Hu Y, Huang Z, Lee C, Wang F, Electret-Material Enhanced Triboelectric Energy Harvesting from Air Flow for Self-Powered Wireless Temperature Sensor Network, *Sensors and Actuators: A Physical* (2010), https://doi.org/10.1016/j.sna.2017.12.067

Electret-Material Enhanced Triboelectric Energy Harvesting from Air Flow for Self-Powered Wireless Temperature Sensor Network

*Yingchun Wu [1,2], Yushen Hu [1], Ziyu Huang [1], Chengkuo Lee [3] and Fei Wang [1,2,4]**

1 Department of Electrical and Electronic Engineering, Southern University of Science and Technology, Shenzhen 518055, China;

2 Shenzhen Key Laboratory of 3rd Generation Semiconductor Devices, Shenzhen 518055, China;

3 Center for Intelligent Sensors and MEMS, National University of Singapore, Singapore;

4 State Key Lab of Transducer Technology, Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, Shanghai 200050, China.

* To whom correspondence should be addressed:

E-mail: wangf@sustc.edu.cn, Tel: (+86) 755-88018509

Highlights:

- Electret based triboelectric generator (E-TriG) with both electrostatic and triboelectric effects are investigated with various electret materials;
- The performance of the triboelectric generator can be improved by negatively charged electrets, while with positively charged electrets, the power output is weakened;
- The E-TriG has been successfully applied for wireless temperature sensing.

Abstract: Energy from wind flow is very common in ambient environment which can be harvested by triboelectric generator effectively. Herein, electret based triboelectric generator (E-TriG) with both electrostatic and triboelectric effects are investigated with enhanced performance comparing with the traditional triboelectric generator based on only contact electrification. Electret materials like PTFE, CYTOP, TOPAS, and COC are prepared with different methods and charged under positive or negative conditions to optimize the material property. It is proved