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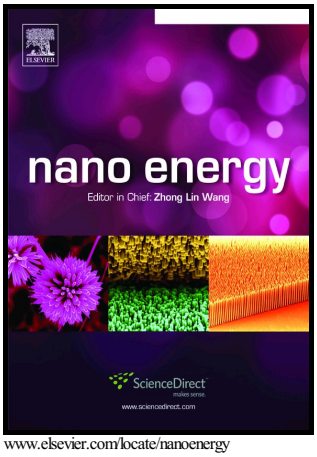

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From triboelectric nanogenerator to self-powered smart floor: a minimalist design

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Abstract

Smart flooring systems are important components of intelligent building for purposes such as health care and security. It is finding that its every step more harshly spotlighted than has ever because it is subtle and intimate to people who come into contact with them. Here we presented a floor tracking system using a large-area single-electrode triboelectric nanogenerator by simply coupling commercial polyvinyl chloride (PVC) flooring with a thin copper film. The system is not only able to collect and convert ambient mechanical energy to electricity with a power-density of 0.5 μA/cm^2, but also enables identifying and tracking footstep patterns by analyzing the movement of the users within a specific area. A detailed architecture and implementation of the smart floor is proposed together with an exhaustive test of its multifunction to give a comparison with other solutions already known to the state