

# When noise gets electrons moving

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Studying the motion of electrons in a disordered environment is no simple task. Often, understanding such effects requires a quantum simulator designed to expose them in a different physical setup.

This was precisely the approach adopted by Denis Makarov and Leonid Kon'kov from the Victor I. Il'ichev Pacific Oceanological Institute in Vladivostok in a new study published in *EPJ B*. They relied on a simulator of electronic motion subjected to noise stemming from a flux of [sound waves](#).

Their findings could lead to semi-conductor devices of a new kind, operated through acoustic radiations. Through numerical simulation, the authors found that noise fluctuations lead to counter-intuitive electron

transport behaviour and a change of direction in atomic transport.

They deduced that being exposed to sound wave fluctuation gives rise to an electronic current that spontaneously changes its direction.

**More information:** Makarov, D. V. and Kon'kov, L. E. (2014). Quantum transport in a driven disordered potential: onset of directed current and noise-induced current reversal. *European Physical Journal B*. DOI: [10.1140/epjb/e2014-50568-3](https://doi.org/10.1140/epjb/e2014-50568-3)

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