

Abstract Submitted
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Spin Hall frequency doubling and spin memristive effects¹ YURIY V. PERSHIN, Department of Physics and Astronomy and USC Nanocenter, University of South Carolina, Columbia, South Carolina 29208, USA, MASSIMILIANO DI VENTRA, Department of Physics, University of California San Diego, La Jolla, California 92093-0319, USA — It is shown that when a time dependent voltage is applied to a system with inhomogeneous electron density in the direction perpendicular to main current flow, the spin Hall effect results in a transverse voltage containing a double frequency component. We demonstrate that there is a phase shift between applied and transverse voltage oscillations, related to memristive behavior of semiconductor spintronics systems. It is interesting that spin memristive effects in this system are manifested directly in the voltage response. A different method to achieve the second harmonic generation, based on the inverse spin Hall effect, is also discussed.

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