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Spin transport in spin chains: Possible applications for spintronics KEVIN VAN HOOGDALEM, DANIEL LOSS, University of Basel — One of the main issues in modern electronics is that as devices get ever smaller the removal of waste energy generated by Joule heating becomes problematic. A possible solution to this problem is offered by spintronics in non-itinerant systems. Here, we theoretically propose the spin-equivalent in such systems of several different components that are used in traditional electronics: the resistance, the diode, and the capacitance. The system we consider here consists of an antiferromagnetic spin chain with anisotropic exchange interaction, connected to two three-dimensional spin reservoirs. We use inhomogeneous Luttinger liquid theory to describe the system, and non-equilibrium methods to calculate the relevant transport properties.

References

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