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Spin Transport in the XXZ Chain at Finite Temperature and Momentum[1] WOLFRAM BRENIG, Technical University Braunschweig, Germany, ROBIN STEINIGEWEG, J. Stefan Institute, Ljubljana, Slovenia — We investigate the role of momentum for the transport of magnetization in the spin-1/2 Heisenberg chain above the isotropic point at finite temperature and momentum [1]. Using numerical and analytical approaches, we analyze the autocorrelations of density and current and observe a finite region of the Brillouin zone with diffusive dynamics below a cut-off momentum, and a diffusion constant independent of momentum and time, which scales inversely with anisotropy. Lowering the temperature over a wide range, starting from infinity, the diffusion constant is found to increase strongly while the cut-off momentum for diffusion decreases. Above the cut-off momentum diffusion breaks down completely.

[1] Robin Steinigeweg and Wolfram Brenig, arXiv:1107.3103

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