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Antiferromagnetic dynamical spin structure factor in doped Heisenberg chains[1] KEVIN JAEGERING, ANNABELLE BOHRDT, SEBASTIAN EGGERT, IMKE SCHNEIDER, Univ. of Kaiserslautern — Inelastic neutron scattering experiments on weakly doped quasi one-dimensional spin chain compounds have found a surprising enhancement of the spectral weight at low energies at the antiferromagnetic point as compared to the pure samples. We now take the weak disorder into account as an effective fragmentation of the spin chains and obtain the momentum-resolved spectral weight for the finite segments at low-lying energies exactly using the density-matrix renormalization group algorithm. The numerical data are compared to bosonization results for scattering wave-vectors $k \approx \pi$, where the impurity contribution to the spin dynamics can be identified in a systematic finite-size scaling analysis. Surprisingly the overall contribution from impurities may either enhance or deplete the dynamical structure factor, depending on wave-vector and spin interaction anisotropy.

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