Supplementary Information: Non-equilibrium Properties of Berezinskii-Kosterlitz-Thouless Phase Transitions

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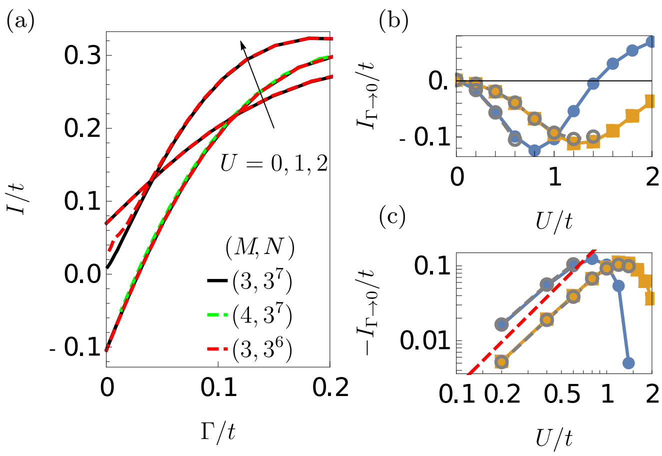

FIG. S1. Demonstration of numerical convergence of the results presented in Fig. 4 of the main text.(a) Shows the current varying the correlation length M and the frequency discretization set by N. Only in the absence of scattering ($U = 0$) we observe some dependence on the chosen frequency discretization, which is the numerically most challenging, but physically trivial parameter set. In addition to the results shown also in Fig. 4 of the main text, here (b) and (c) show the results obtained using $M = 4$ in gray. The negative $\mathcal{O}\left(U^2\right)$ correction to the current is unaffected.

NUMERICAL CONVERGENCE

Within the numerical implementation of the renormalization-group framework we present, numerical convergence was always checked. The major parameters, that have to be controlled are (a) the discretization of frequency space and (b) the maximum correlation length M allowed for the self-energy, enforced by

$$\Sigma_{i,j}(\omega) \approx 0 \;\forall |i-j| \geq M. \tag{1}$$

To check convergence with respect to both we vary the size of the frequency grid, where the total number of grid points is denoted by N as well as the length M. Fig. S1 summarizes such convergence checks for the results discussed in Fig. 4 of the main text as an example.