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Quenched dynamics in a spin-1/2 chain prepared in a sharp domain wall state LEA SANTOS, Yeshiva University, ADITI MITRA, New York University, EMIL PRODAN, Yeshiva University — Using exact diagonalization and Expokit, we study the time evolution of current, magnetization and correlation functions in an isolated spin-1/2 chain initially prepared in a domain wall state. The domain wall consists of spins pointing up in the first half of the chain and down in the other half. Integrable and nonintegrable regimes are reached by adjusting the parameters of the Hamiltonian, which allows for the comparison of behaviors in both limits. In a chain with nearest- neighbor couplings, chaos is induced by adding on-site disorder or by adding next-nearest-neighbor couplings. The magnitude of the current decreases with interaction for the clean integrable system and for the chaotic disordered case. For the chaotic clean system with next-nearest-neighbor couplings, a non- monotonic behavior in the current is found as the interaction strength is increased.

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