Entropy production in non-equilibrium steady states[1] DANIEL BEN-AVRAHAM, Clarkson University, SVEN DOROSZ, University of Luxembourg, MICHEL PLEIMLING, Virginia Tech — We discuss entropy production in non-equilibrium steady states by focusing on paths obtained by sampling at regular (small) intervals, instead of sampling on each change of the system's state. This allows us to directly study entropy production in systems with microscopic irreversibility. The two sampling methods are equivalent otherwise, and the fluctuation theorem also holds for the different paths. We focus on a fully irreversible three-state loop, as a canonical model of microscopic irreversibility, finding its entropy distribution, rate of entropy production, and large deviation function in closed analytical form, and showing that the observed kink in the large deviation function arises solely from microscopic irreversibility [1].

[1] D. ben-Avraham, S. Dorosz, and M. Pleimling, Phys. Rev. E 84, 011115 (2011)

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