Coulomb gas scaling of the non-equilibrium spin-boson model\textsuperscript{1}  
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— The nonequilibrium “spin-boson model,” a localized electronic level coupled to  
a fluctuating two-state system and to two electronic reservoirs, is solved via an  
Anderson-Yuval-Hamann mapping onto a plasma of alternating positive and neg-  
ative charges time-ordered along the two “Keldysh” contours needed to describe  
onequilibrium physics. The interaction between charges depend on whether their  
time separation is small or large compared to a dephasing scale defined in terms of  
the chemical potential difference between the electronic reservoirs, and a decoher-  
ence scale defined in terms of the current flowing from one reservoir to another. A  
onequilibrium scaling transformation is introduced. An important feature is the  
presence in the model of a new coupling, essentially the decoherence rate, which  
acquires an additive renormalization similar to that of the energy in equilibrium  
problems. The resulting flow equations are used to study the competition between  
the dephasing-induced formation of independent resonances tied to the two chemical  
potentials, and the decoherence which cuts off the scaling and leads to effectively  
classical long-time behavior.

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