Non-axisymmetric Deformations of Monovalent Metallic Nanowires: A Stochastic Field Theory Approach LAN GONG, DANIEL STEIN, New York University, JEROME BUERKI COLLABORATION, CHARLES STAFFORD COLLABORATION — A stochastic Ginzburg-Landau field theory is used to describe the noise-induced transition of monovalent metallic nanowires. Here the transition consists of the nanowire changing from one locally stable radius to another (and thereby changing its conductance as well). The lifetime of a specific wire configuration is obtained from the Kramers rate formula in the limit of of weak noise. We found a "phase transition" in the saddle state under general conditions, and have constructed a phase diagram of the activated transition. To study the transition process further, we employed a numerical approach called the string method in order to obtain in detail the complete transition path, crucial to solving the dynamics of wire deformation and transition under noise. We also discuss several interesting applications to lifetime calculations for real nanowires.

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