Munchhausen effect, tunneling in an asymmetric SQUID

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A classical system cannot escape out of a metastable state at zero temperature.However, a composite system made from both classical and quantum degrees of freedom may drag itself out of the metastable state by a sequential process. The tunneling of the quantum degree of freedom entails a distortion in the trapping potential of the classical junction, which might be sufficiently large to transform the metastable state into an unstable one. The classical component then escapes. Such a situation can be conveniently studied and implemented in a dynamically asymmetric dc SQUID with two Josephson junctions of equal critical current I_c but strongly different shunt capacities C and/or shunt resistances R. We determine the dynamical phase diagram of this SQUID for various choices of junction parameters.