

A
FIZIKAI INTÉZET
és az
ATOMKI
közös
SZEMINÁRIUMA

DOMOKOS PÉTER

(WIGNER FIZIKAI KUTATÓKÖZPONT, SZILÁRDTESTFIZIKAI ÉS OPTIKAI INTÉZET)

**Finite-size scaling of the photon-blockade
breakdown dissipative quantum phase transition**

címmel előadást tart

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az Atommagkutató Intézet nagy előadótermében
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Short abstract: We prove that the observable telegraph signal accompanying the bistability in the photon-blockade-breakdown regime of the driven and lossy Jaynes–Cummings model is the finite-size precursor of a genuine first-order phase transition in the thermodynamic limit. By unraveling the stationary solution into quantum trajectories, we resolve the nature of coexistence of phases in the time domain. We construct a finite-size scaling of the parameters to the thermodynamic limit, which refers to the same microscopic quantum system, such that the steady-state density matrix is kept invariant, meanwhile the stability of the phases increases and the characteristic lifetime tends to infinity. By showing the existence of this finite-size scaling, we complete and justify the analogy of the photon-blockade-breakdown effect to a dissipative quantum phase transition of the first order.