

No. 75

The final fate of instability of Reissner-Nordstrom-AdS black holes

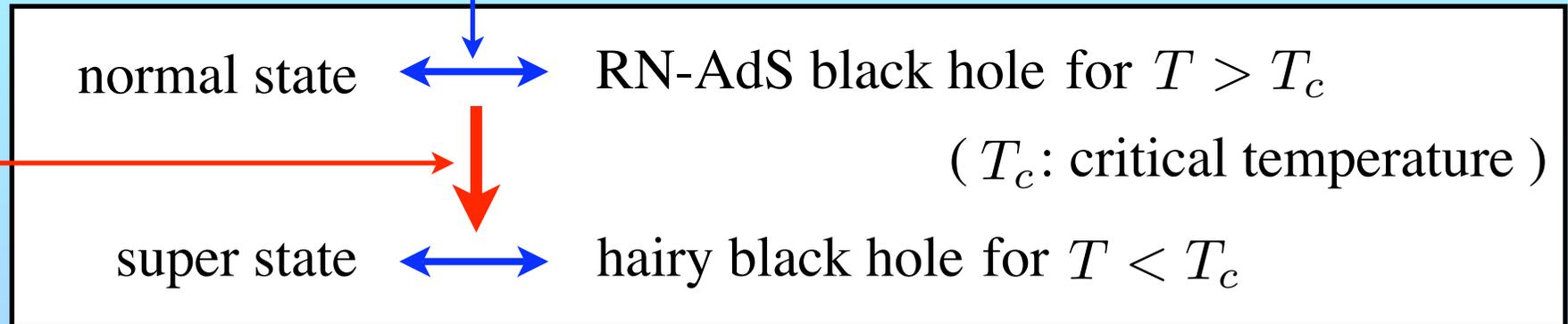
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Holographic superconductor

(Hartnoll, Herzog, and Horowitz '08)

AdS/CFT



2nd-order phase transition

emergence of marginally stable solution (Gubser '08)

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static solution at $T = T_c$

Is RN-AdS with $T < T_c$ dynamically unstable ?

Does RN-AdS with $T < T_c$ evolve towards hairy black hole ?

Our study

We analyze

dynamical (in-)stability ← quasi-normal mode

thermodynamical (in-)stability ← black hole entropy

and conclude

RN-AdS black hole with $T < T_c$ is **unstable**

and evolves towards the hairy black hole

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final state of the instability

the phase transition of holographic superconductor does occur dynamically

the same instability occurs, independently of
the topology of 2-d cross-section of horizon