

Abstract Submitted
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Hair on near-extremal Reissner-Nordström AdS black holes

JAMES ALSUP, University of Michigan-Flint, GEORGE SIOPSIS, JASON THERRIEN, University of Tennessee — We discuss hairy black hole solutions with scalar hair of mass m and (small) electromagnetic coupling q^2 , near extremality. Hair forms below a critical temperature T_c and for $q^2 > q_c^2$ where q_c^2 is determined by the AdS₂ geometry of the horizon and can be negative. At the critical point $q^2 = q_c^2$, the critical temperature vanishes; there is no instability below q_c^2 . We perform explicit analytic calculations of T_c , the condensate and the conductivity for $m^2 = -2$, in which case $q_c^2 = -\frac{1}{4}$. We show that the gap in units of T_c diverges as $T_c \rightarrow 0$. We find no discontinuity in the behavior of the system across $q^2 = 0$.

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