Ministry of Science
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Spacetime near an extremal horizon

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I will discuss the inverse problem of determining the spacetime near an extremal Killing horizon with a prescribed, spatially compact near-horizon geometry. I will show that in Einstein-Maxwell theory with a cosmological constant, the Einstein and Maxwell equations for the infinitesimal deformations transverse to the horizon reduce to a system of elliptic PDEs for the extrinsic curvature of a cross-section of the horizon and the vector potential on the cross-section, hence there exists a finite dimensional moduli space of such deformations. I will then discuss the most general axisymmetric transverse deformation of a Kerr-Newman horizon.

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