

Abstract Submitted
for the APR13 Meeting of
The American Physical Society

A positive energy theorem for the gravitational Dirichlet problem WILLIAM KELLY, DONALD MAROLF, UCSB — Gravity in the presence of a Dirichlet boundary condition (fixed metric on some time-like surface) has been extensively studied in the context of the AdS/CFT correspondence. We show that this system is stable in the sense that energy is bounded below by generalizing Witten's proof of the positive energy theorem. Our proof applies to 3+1 dimensional spacetimes with vanishing cosmological constant, though we expect similar results to hold in higher dimensions and for negative cosmological constant. We also prove, under the same conditions, the familiar inequality $M \geq (Q^2 + P^2)^{1/2}$, where M is the ADM mass and Q and P are the total electric and magnetic charge of the spacetime.

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Date submitted: 11 Jan 2013

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