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**Lydia R Bieri\*** ([lbieri@math.harvard.edu](mailto:lbieri@math.harvard.edu)), Harvard University, Department of Mathematics, Science Center, 1 Oxford Street, Cambridge, MA 02138. *Energy Estimates in an Extension of the Stability Theorem of the Minkowski Space in General Relativity.*

This talk addresses the issue of energy estimates in the initial value problem for the Einstein vacuum equations in GR. The famous result by D. Christodoulou and S. Klainerman proving the global nonlinear stability of the Minkowski space in GR, was a major breakthrough in the study of the Cauchy problem in GR. In the proof of an extension of this result, we use energy estimates of the type used in the original work. In our situation, where we assume less conditions on the initial data, and therefore the spacetime curvature is no longer bounded in  $L^\infty$ , we first have to find the appropriate energies which then have to be controlled. These energies are used in a comparison argument to bound the curvature terms. This procedure takes place within a bootstrap argument, on which the main proof is based. In contrast to the original result, we encounter borderline terms, indicating that the conditions in our main theorem are sharp in so far as the assumptions on the decay at infinity on the initial data are concerned. In particular, these borderline cases appear also in some of the energy estimates. (Received August 25, 2009)