

Abstract Submitted
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On the Existence of Radiation Gauges in Petrov Type II Spacetimes LARRY PRICE, KARTHIK SHANKAR, BERNARD WHITING, University of Florida — The radiation gauges used by Chrzanowski (his IRG/ORG) for metric reconstruction in the Kerr spacetime seem to be over-specified. Their specification consists of five conditions: four (which we treat here as) “gauge” conditions plus an additional condition on the trace of the metric perturbation. In this work, we utilize a newly developed form of the perturbed Einstein equations to establish a condition — on a particular tetrad component of the stress-energy tensor — under which one can impose the full IRG/ORG. In a Petrov type II background, imposing the IRG/ORG requires (consistently) setting a particular component of the metric perturbation to zero “by hand.” By contrast, in a generic type D background, gauge freedom can generally be used to achieve this. As a specific example, we work through the process of imposing the IRG in a Schwarzschild background, using a more traditional approach. If time permits, implications for metric reconstruction using the Teukolsky curvature perturbations in type D spacetimes will be briefly discussed.

Larry Price
University of Florida

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