

Abstract Submitted  
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**Self-force in nonvacuum spacetimes** ERIC POISSON, University of Guelph — The gravitational self-force has thus far been formulated and computed in vacuum spacetimes. This is adequate for many applications, including the modelling of extreme mass-ratio inspirals around black holes. In other applications, however, such as the incorporation of the self-force in Hubeny’s overcharging scenario (in which a Reissner-Nordstrom black hole may become overextreme by the absorption of a charged particle), the self-force must be formulated in a nonvacuum spacetime. In this talk I describe ongoing work with Peter Zimmerman on the formulation of the self-force when the background metric is not a solution to the vacuum field equations. We consider two types of situations, one involving a background spacetime with a background scalar field, which gives rise to a coupled scalar and gravitational self-force, and another involving a background electromagnetic field, which gives rise to a coupled electromagnetic and gravitational self-force.

Eric Poisson  
University of Guelph

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