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Kerr self-force via elliptic PDEs

Monday, 3 July 2023 12:00 (20 minutes)

We are pursuing Lorenz gauge Kerr self-force calculations based on an m-mode scheme in the frequency domain. Prior hyperbolic partial differential equation (PDE) formulations encountered numerical instabilities involving unchecked growth in time; our method is based on elliptic PDEs, which do not exhibit instabilities of that kind. For proof of concept we calculated the self-force acting on a scalar charge in a circular orbit around a Kerr black hole, and progress towards the gravitational case will be discussed.

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