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## Notes on the Asymptotics of near Kerr Initial Data by Evolutionary Solvers

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We studied the asymptotic behavior of perturbed Kerr initial data by solving the evolutionary form of the vacuum Einstein constraint equations. Unlike in the elliptic formulation, solving the constraints in their evolutionary form, we have direct control over the constrained data only on a single 2-surface. This immediately raises the question of whether it can guarantee asymptotic flatness of initial data. Previous works based on perturbed Schwarzschild initial data have already demonstrated that it is possible to guarantee the asymptotic flatness of solutions. Integrating the equations numerically, we found that results on the modified parabolic-hyperbolic system can be generalized to perturbed Kerr initial data. We have also investigated a new, more robust method for the algebraic-hyperbolic system. Part of this work is funded by NSF CAREER Award PHY-2047382 and NKFIH Grant No. K-115434.

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