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Towards a Standardized Characteristic Extraction Tool MARIA BABIUC, Marshall University — Knowing the precise details of the gravitational wave signature obtained from numerical simulations of binary black hole mergers is a key requirement for meaningful detection and scientific interpretation of the data. However, the waveforms are not easy to be accurately computed. The importance of this problem to the future of gravitational wave astronomy is well recognized. Cauchy-Characteristic Extraction (CCE) is the most precise and refined extraction method available. The CCE technique connects the strong-field Cauchy evolution of the spacetime near the merger to the characteristic evolution to future null infinity where the waveform is extracted in an unambiguous way. Recently, we developed and tested an improved characteristic waveform extraction tool, and demonstrated accuracy and convergence of the numerical error for a binary black hole inspiral and merger. The present version of the extraction module streamlines the start-up of the auxiliary variables by avoiding the use of Taylor expansions. Here, this new method is compared and calibrated in test problems based upon linearized waves. This work offers a practical and efficient way to gain information toward improving the performance of the code and represents a valuable step toward making the extraction tool public.

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