SUMMARY. The idea is to match a "3 + 1" interior Cauchy evolution to an exterior characteristic evolution at a world-tube r_M = (approximately) constant. The important point is that since the characteristic evolution may be rigorously compactified, the whole spacetime to future null infinity is representable on a finite grid. Thus the only error made in a calculation of the gravitational radiation at infinity is that due to the finite discretisation Δ, which is $O(\Delta^2)$ for a second-order algorithm.

The standard procedure, however, is to perform a pure Cauchy evolution in a domain of radius r_B. The gravitational radiation at infinity is estimated from its value at $r = r_B$, and it is shown that the error so introduced is of order r_B^{-2}. Thus a large value of r_B is required for a highly accurate solution.

For a given target accuracy ϵ there is an upper limit on Δ in both CCM and in a pure Cauchy evolution. However, in the pure Cauchy case, there is also a lower limit on the value of r_B. This has an implication on the amount of computation required for the two methods. The effect is significant for high accuracy, i.e. small ϵ: the amount of computation for CCM, compared to that for pure Cauchy, scales as $\epsilon^{3/2}$.