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Towards time adaptivity for convolution equations arising in wave problems

We address the efficient numerical approximation of time convolution equations. Our applications include the approximation of retarded potentials associated to wave problems. By working in the Laplace domain, we propose a time-stepping method which allows to use variable steps, possibly driven by some error control mechanism. We present a priori error estimates for our method and some ideas for the control of the steps. The implementation is delicate and relies on contour integral techniques in the complex plane. Numerical experiments are presented to show the potential of our approach.