Causality in Classical Electrodynamics: a Comparison of Different Approaches HIMAL RATHNAKUMARA, MANUEL BERRONDO, Brigham Young University — Causality for classical charged particles has been traditionally interpreted in terms of the retarded solution of Maxwell's equations. Combined with the Lorentz equation, radiation reaction for point particles produces runaway solutions. On the other hand, Feynman's propagator implies causality in terms of the proper time of the particle and is hence compatible with classical electrodynamics where proper time and the time coordinate flow in the same direction. In this work, we propose to find the radiation reaction equation for a classical point charged particles assuming causality in the Feynman-Stuckelberg sense with the aid of the Clifford algebra formalism. We provide a comparison of methods which will give insight into the solution.

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