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Memory-like effects arising from relative velocity and acceleration ALEXANDER GRANT, DAVID NICHOLS, Univ of Virginia — The gravitational wave memory effect reflects a permanent change in separation of a pair of initially comoving test particles caused by a burst of gravitational waves. Near null infinity, the contributions to the memory effect split into two categories: linear memory, which appears even in linearized gravity, and nonlinear memory, which arises due to the nonlinear nature of general relativity. Moreover, this nonlinear effect is expected to be the dominant contribution to the memory effect for binary black hole mergers, such as those detected by LIGO and Virgo. In this talk, we discuss how the final separation of test particles depends not only on initial separation (as in the usual memory effect), but also the initial relative velocity and the relative acceleration of the test particles. Each of these contributions provides additional memory-like effects near null infinity, and we show that, like the usual memory effect, a similar linear vs. nonlinear split arises.

Alexander Grant
Univ of Virginia

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