

Abstract Submitted
for the APR15 Meeting of
The American Physical Society

Mass? What Mass? –Inertial Forces In Massless Systems JOHN JOHNSON¹, Retired, formally a research physicist at AMRDEC, Redstone Arsenal, AL 35989 — Inertial forces in massless systems are possible due to, of all things, simple propagation delays of the binding forces. Analysis at the classical level shows that in addition to intrinsic masses there are effective inertial mass contributions due to the interaction forces themselves. For $1/r$ potentials the effective mass is E/c^2 , but for more complex potentials this is not true. The general form of the effective mass term is shown, and in addition the inertial force density of an electromagnetic field is derived. While these analytical results are in the classical regime, it is argued that the retardation mechanism must apply to any interacting system of finite spatial extension.

¹Doctorate, UM College Park, 1979

John Johnson
Retired, formally with AMRDEC, Redstone Arsenal, AL 35989

Date submitted: 12 Dec 2014

Electronic form version 1.4