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The Gravitational Memory Effect

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In this dissertation we intend to study the background related to the memory effect that leads to “gravitational-wave memory effect” and two types of memory effect:(1) We intend to study a whole outline of what is memory effect.(2) We intend to solve the linear memory for N Gravitationally Unbound Particles where we will study different kinds of spherical harmonics,mass quadrupole leading to linear memory effect.

$$\boxed{\Delta \hat{h}^{TT}_{jk} = \triangleleft \sum_{A=1}^N \frac{4M_A}{r \sqrt{1-v_A^2}} \left[\frac{v^j_A v^k_A}{1-v_A^2} \right] \hat{T}^{TT}} \end{math>$$

(3) Then we try to examine the memory effect for the individual radiated neutrinos

$$\hat{h}^{xx}_{TT} = h(r,t) = \frac{2G}{rc^4} \int_{t-r/c}^{-\infty} dt' L_{\nu}(t') \alpha(t')$$

(4) Then we will discuss briefly about the introduction of non linear memory effect.

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