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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 quadrapole leading to linear memory effect.

$$\Delta h_{jk}^{TT} = \triangle \sum_{A=1}^{N} \frac{4M_A}{r\sqrt{1-v_A^2}} \left[\frac{v_A^j v_A^k}{1-v_A \cdot N}\right]^{TT}$$

(3)Then we try to examine the memory effect for the individual radiated neutrinos citemukhopadhyay2021memory $\mathrm{h}_{TT}^{xx} = h(r,t) = \frac{2G}{rc^4} \int_{-\infty}^{t-r/c} dt' L_\nu(t')\alpha(t'), where c is the speed of light, t is the time post bounce and G$ is the all-flavors neutrino luminosity α is the time-varying anisotropy parameter as mentioned in \cite{mukhopadhyay2021neutrino}
(4) Then we will discuss briefly about the introduction of non linear memory effect.

Primary author: Ms MITRA, DEESHANI (St Xavier's College(Autonomous),Kolkata)

Presenter: Ms MITRA, DEESHANI (St Xavier's College(Autonomous),Kolkata)