How do you get GWs in the first place?

Moving mass-energy.

EM analogy: most dominant radiation from electric dipole

$$\frac{dE_{nergy}}{dt} \sim \left|\ddot{\vec{d}}\right|^2$$

where $\vec{d} = \sum_A q_A \vec{x}_A$

Next is magnetic dipole

$$\frac{dE_{nergy}}{dt} \sim \left|\ddot{\vec{\mu}}\right|^2 \qquad \vec{\mu} = \sum_A \vec{r}_A \times \underbrace{q\vec{v}_A}_{\text{current}}$$

Gravitation: "E dipole" = $\vec{d} = \sum_A m_A \vec{x}_A$

$$\dot{\vec{d}} = \sum_A m_A \dot{\vec{x}}_A = \vec{P} \quad \underline{\text{conserved}}$$

"M dipole" $\vec{\mu} = \sum_A \vec{r}_A \times (m\vec{v}_A) = \vec{J}$ $\underline{\text{conserved}}$

No grav. dipole radiation

Next is electric quadrupole   bingo!

Will show, for weakly gravitating sources, $\left(\begin{array}{c} v \lesssim \left(\frac{M}{R}\right)^{1/2} \ll 1 \\ R \ll \lambda \end{array} \right)$

$$\boxed{h^{TT}_{ij}(t-r) = \frac{2}{r}\ddot{I}^{TT}_{ij}(t-r)} \qquad \dot{} = \frac{\partial}{\partial t}$$

Where $I_{ij} \equiv \int T^{00}\left(x_i x_j - \frac{1}{3}\delta_{ij} r^2\right) d^3x$

reduced quadrupole moment

and $I^{TT}_{ij} = P_{il} P_{jm} I^{lm} - \frac{1}{2} P_{ij} P_{lm} I^{lm}$

$$P_{ij} \equiv \delta_{ij} - \frac{x_i x_j}{r^2}$$

Also, will show

$$\boxed{\begin{aligned} \left.\frac{dE}{dt}\right|_{GW} &= \frac{1}{5}\left\langle \dddot{I}_{ij} \dddot{I}^{ij} \right\rangle \\ \left.\frac{dL_i}{dt}\right|_{GW} &= \frac{2}{5}\varepsilon_{ijk}\left\langle \ddot{I}^{jl} \dddot{I}_l{}^k \right\rangle \end{aligned}}$$