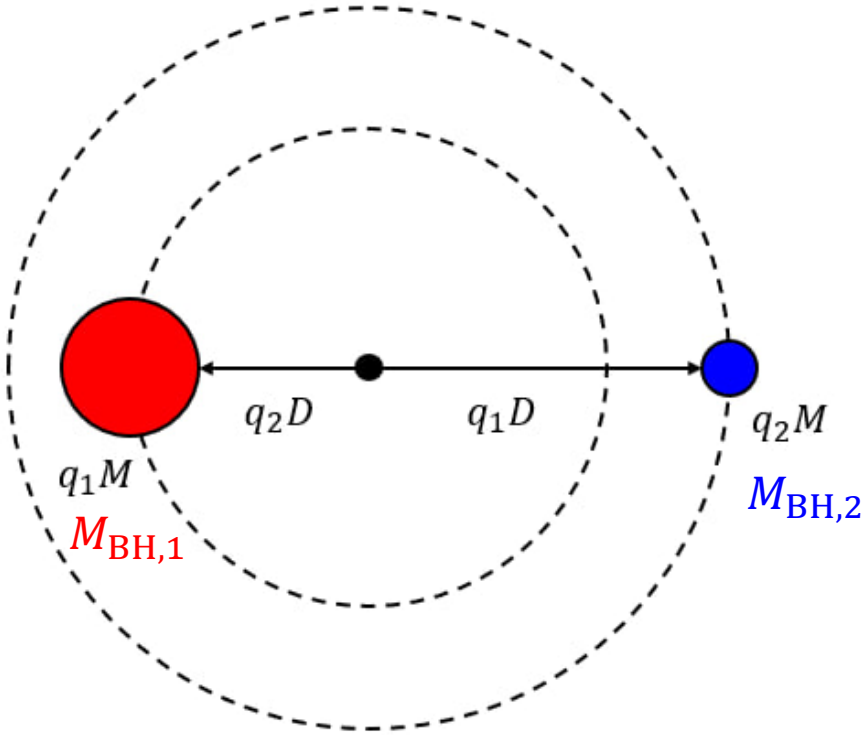


$$v_1 = \sqrt{\frac{GM}{D}q_2^2 + \frac{GM_{\mathrm{inside}}(q_2D)}{q_2D}}$$

$$v_2 = \sqrt{\frac{GM}{D}q_1^2 + \frac{GM_{\mathrm{inside}}(q_1D)}{q_1D}}$$

Simulation Setup

$L = 16\mathrm{pc}$

$D_0 = 0.9\mathrm{pc}$

$\Delta x = \frac{16}{256}\mathrm{pc} \cong 0.06\mathrm{pc}$

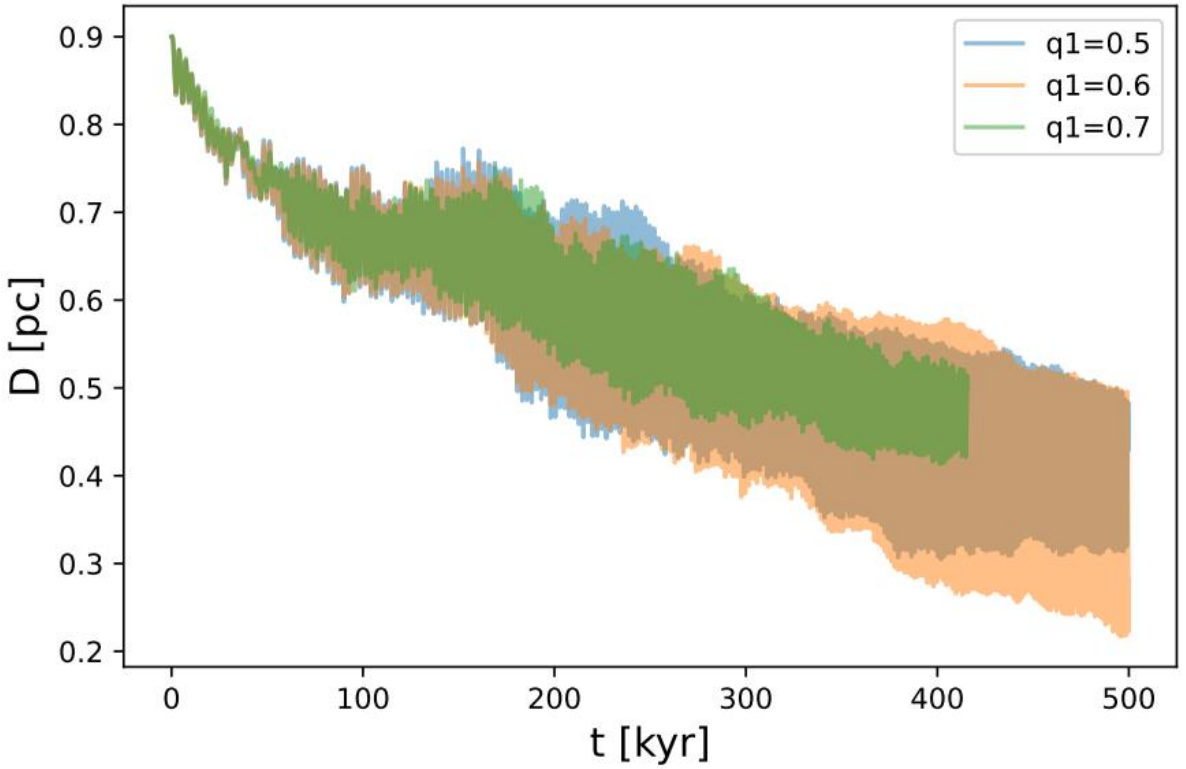
Step factor = 1

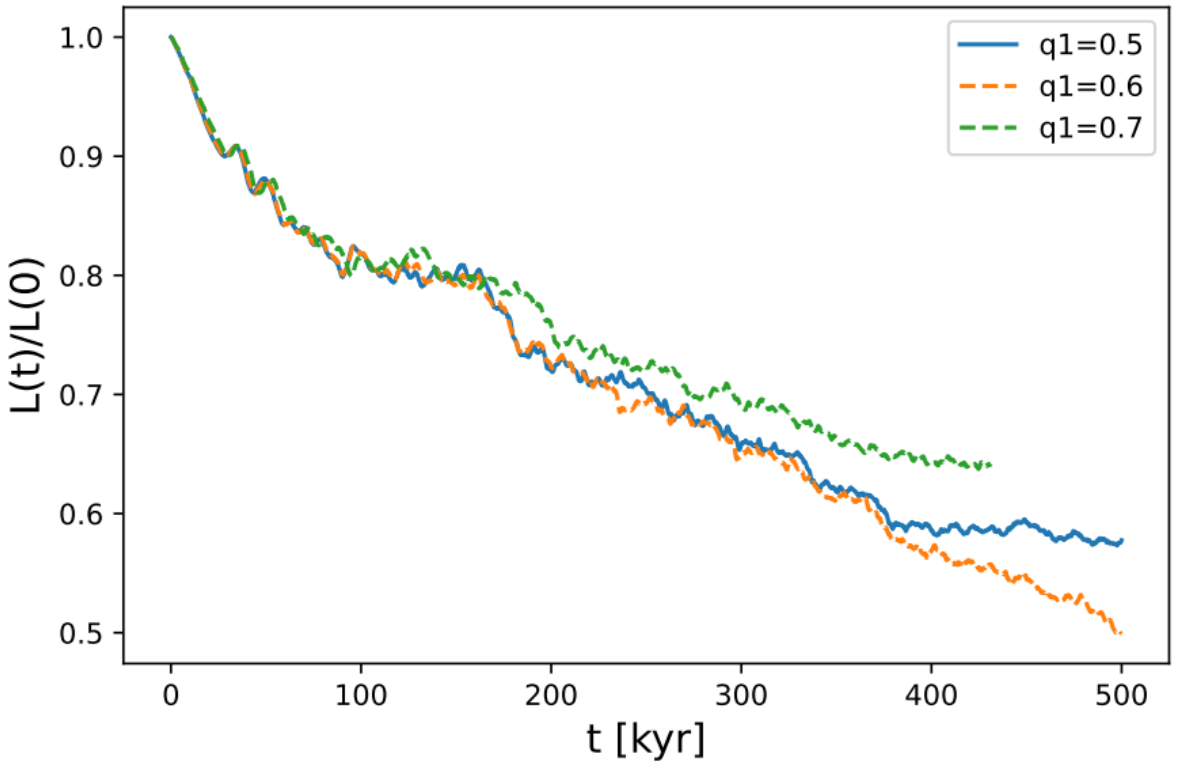
Initial Configuration

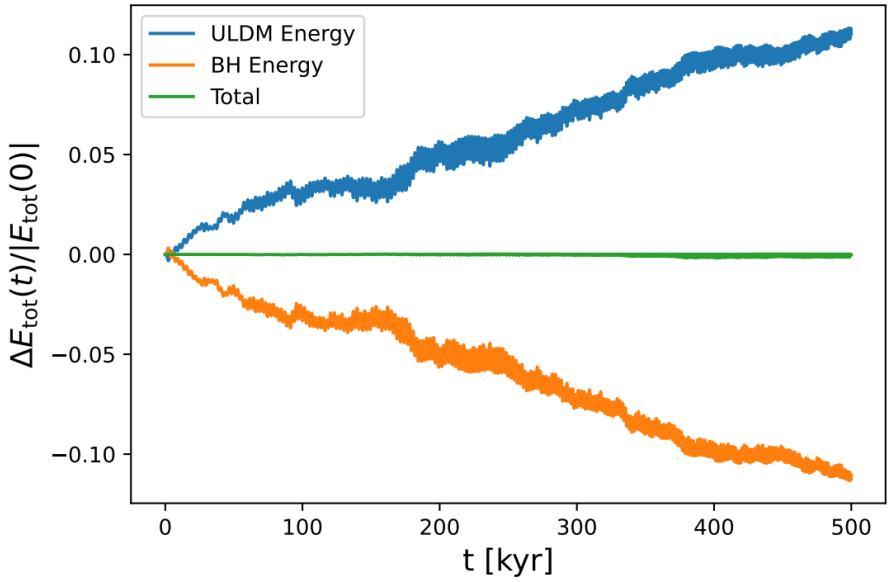
$M_{\mathrm{sol}} = 10^9 M_\odot$

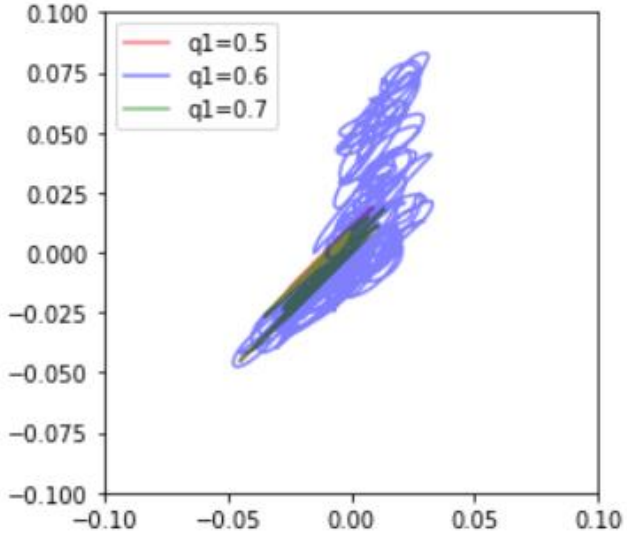
$M_{\mathrm{BH},1} + M_{\mathrm{BH},2} = 2 \times 10^8 M_\odot$

$r_{1/2} = 2.3\mathrm{pc}$









COM Displacement of BBH