Run an EFT simulation with tidal effects for a star of 1 solar radius, 1 solar mass and polytropic index of n = 1.5 that correspond to first love number k =0.143 interacting with a 2 solar mass black hole

$$m_\star a = -\frac{G m_\star m_\bullet}{r^2} - \frac{9 n_E G^2 m_\bullet^2}{r^7}$$

The coefficient n_E can be computed theoretically as to run the simulation. Theoretically $n_E = 0.0955193$

$$n_E = 2kr_\star^5/3G$$

After running the simulation, computed the value of n_E from the data generated as

$$n_E = \frac{r^5}{9G}\frac{m_\star}{m_\bullet}\left(+\frac{a_{sim}}{F_\Phi} - 1\right) \quad , \quad F_\Phi = \frac{-Gm_\bullet}{r^2}$$

The value computed from data is in agreement with the value used in the simulation. Thus, we are ready to implement some hydrodynamics code to measure this value