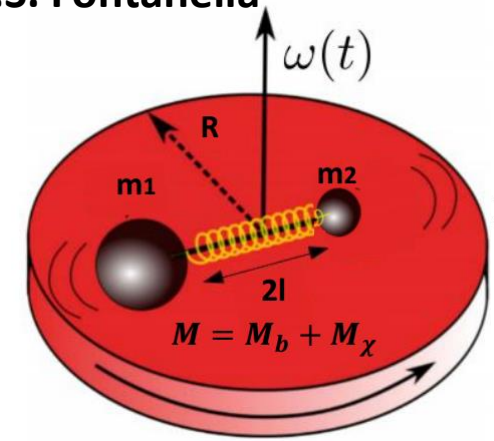
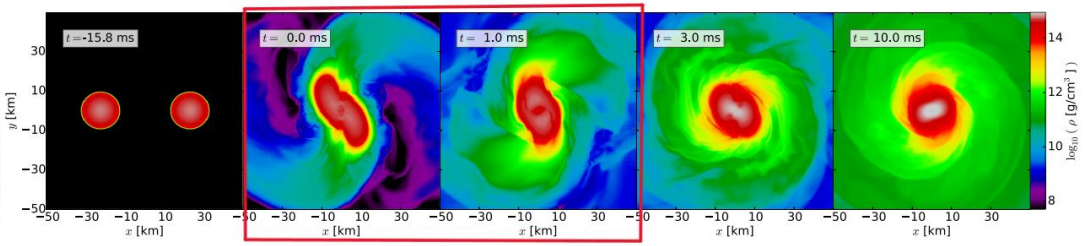
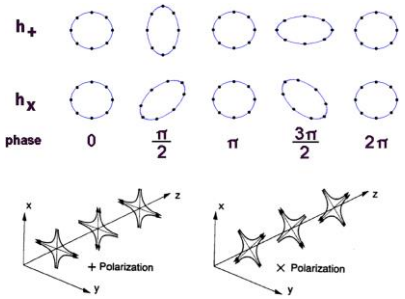
# Binary Neutron Star mergers in a dark environment with an efective Lagrangian approach.

**D.S. Fontanella**

**Dark Matter 2023: From the Smallest to the Largest Scales: May 29th-June 02nd**



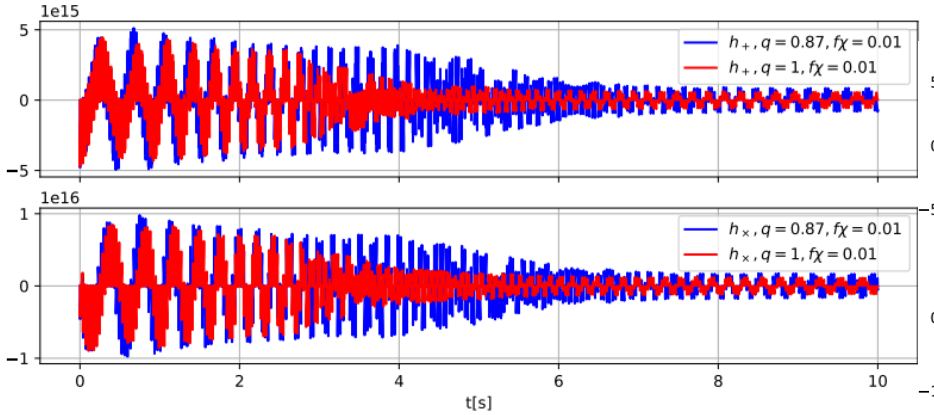

VNiVERSiDAD D SALAMANCA

$$L = \frac{2(1-f_{ejec})q^2}{1+q}\frac{M_c^{5/2}}{2\mu^{3/2}}(\dot{r}^2 + (r\dot{\theta})^2) + \frac{f_{ejec}\frac{M_c^{5/2}}{\mu^{3/2}} + M_\chi}{2}R^2\dot{\theta}^2 - \frac{(1+q^2)}{2}k(\frac{l}{1+q} - r)^2$$

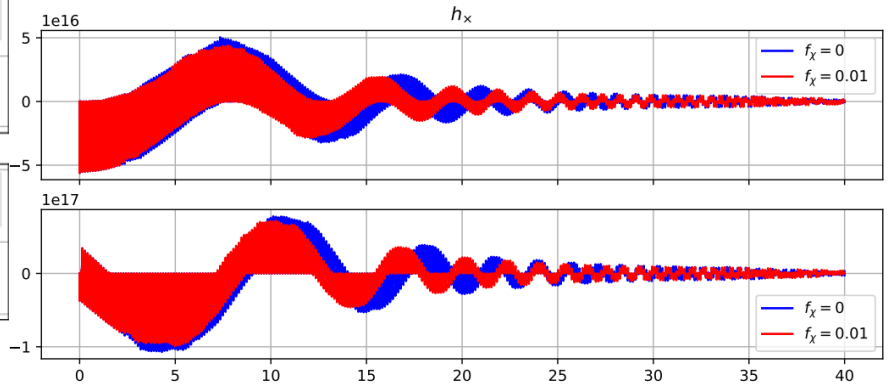
$$F_d = -(\alpha\frac{M_b}{R} + \beta\frac{M_\chi}{R})\dot{r}^2.$$

$$dh_+ = (1-f_{ejec})\frac{M_c^{5/2}}{\mu^{3/2}}q(2\dot{r}^2cos(2\theta) + 2r\ddot{r}cos(2\theta) - 4r\dot{r}\dot{\theta}sin(2\theta) - 4r\dot{r}\dot{\theta}sin(2\theta) - 2r^2\ddot{\theta}sin(2\theta) - 4r^2\dot{\theta}2cos(2\theta))$$

$$dh_\times = 4(1-f_{ejec})\frac{M_c^{5/2}}{\mu^{3/2}}q((\dot{r}^2 + r\ddot{r} - 2r^2\dot{\theta}^2)sin(2\theta) + (4r\dot{r}\dot{\theta} + r^2\ddot{\theta})cos(2\theta))$$




**Polarization for dierent values of the mass rate assuming a small amount of DM f = 0:01 in the disk**




**Phase shift of the polarizations due to a DM = M/100 DM in the disk.**

**Comparison between PSDs for the interval t2 [0; 100]**