**Scientific Reports Supplementary Information**

**A robophysical model of spacetime dynamics**

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**Supplementary movie**

This movie first shows the trajectories of a passive marble and an active vehicle in experiments. The passive marble and the active vehicle started with the same initial radius and velocity. Then, it shows the trajectories of a simulated active vehicle for different inverse latus recta and different semi-major-axes.

**Raw data**

The MATLAB code `plotExperiment.m` in the zip file uses the raw data in the same folder to plot the trajectories, the time evolution of the radius, and the time evolution of the speed for the passive marble and the active vehicle (Fig.2b in the main manuscript). The curves for the passive marble and the active vehicle are shown in blue and red respectively.