Predicting the X-ray emission from a magnetar remnant of binary neutron stars mergers: application to the SVOM mission

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In recent years, the domain of gamma-ray bursts (GRBs) physics has known many breakthroughs. Nevertheless, some aspect of our models remain unsolved. In particular, the nature of the object powering the GRBs' relativistic jets is still debated. Until recently, a black hole as the central engine of GRBs was the most widely accepted model; however, there is growing evidence that may indicate the possibility of a millisecond magnetar as an engine of these powerful explosions. The event of the 17th August 2017, as the first joint observation of a gamma-ray burst electromagnetic signal along with its gravitational wave (GW) counterpart, opened the way to multi-messenger astrophysics, and offered astrophysicists solid evidences in support of models involving the merger of two neutron stars for short GRBs. The nature of the neutron stars merger remnant, beyond reach from our observations until now, might be concealed in the X-ray afterglow light curves of those events. We developed a model for the emission expected from a newborn millisecond magnetar, and made predictions of their X-ray light curves. The output of our model can be applied, through a realistic GW detection scenario, to potential future X-ray observations of GW counterparts, in particular for the recently launched SVOM mission. In this presentation, I will discuss how the simulation of X-ray lightvcurves can be used to predict the detectability of such events by the MXT instrument on board SVOM, and how this could enable us to better understand GRBs progenitors.