Sixteenth Marcel Grossmann Meeting



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GRB-SN association and Inferences of GRB 190114C for the Crab pulsar and the supernova remnant

Tuesday, 6 July 2021 10:30 (30 minutes)

We assume that the progenitor of the Crab nebula and of the Crab pulsar, like GRB 190114C is a binarydriven hyper-novae of type I (BdHNe I). In BdHN I the explosion of the supernova as well as of the role of the hypercritical accretion of the SN ejecta onto the binary companion neutron star (NS) and onto the newbornNS (vNS) have central role. The synchrotron emission powered by the vNS-pulsar emission and the accreted SN ejecta onto the vNS, gives origin to the X-ray afterglows. We evidence that the X-ray afterglow luminosity of GRB 190114C, selected as a prototype, extrapolated to 1000 yr, coincides with the currently observed emission of the Crab Nebula. We model the vNS through the equilibrium sequence of Maclaurin spheroid. By requiring that the vNS period extrapolated to 1000 yr coincides with the one of PSR B0531+21 (the Crab pulsar) , we study the evolution of the spin of the vNS with the initial P = 0.9 ms.

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