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The importance of the cocoon emission in double Neutron star mergers

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Following a Neutron star merger a jet propagates and interacts with the out
owing
ejecta that surrounds the merger. As a result matter is pushed around the jet to form a hot cocoon which applies pressure on the jet and potentially collimates it. The cocoon envelops the jet as long as the jet propagates within the dense ejecta. After the jet breaks out, the cocoon expands and emits radiation over large angles throughout the entire electromagnetic spectrum, from Gamma-rays to radio. In GW170817 the cocoon is a leading candidate to be the source of the observed Gamma-ray emission and dominated the frst appr. 2 months of the afterglow emission, until the jet decelerated enough to become visible. Likewise, observations of future double NS merger events are also expected to be dominated by the cocoon emission due to the beaming of the jet emission. Furthermore, it is possible that some jets are choked inside the ejecta, in which cases the cocoon becomes the leading candidate to produce the entire prompt and afterglow emissions. In this talk I will present the different mechanisms of emission from the cocoon and discuss what we can learn about the GW170817 system from observations. I will end with what it tells us about future double Neutron star merger detections.

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