Study of the production of high-energy neutrinos in the environment of binary-neutron-star mergers

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- In this work we considered the end-state of a binary-neutron-star (BNS) merger as neutrino sources. Assuming the presence of an acceleration mechanism for charged particles, we studied the production of UHECRs and high-energy neutrinos within the environment of a BNSmerger.

- The measured neutrino flux by IceCube cannot be explained as only due to Gamma-Ray Bursts or Active Galactic Nuclei, and alternative sources for astrophysical neutrinos are studied.

- We performed simulations within the source environment characterized by a thermal black body photon field powered by nuclear decay and by a non-thermal synchrotron component. We defined several scenarios characterized by physical parameters as the injected energy spectrum, maximum source temperature, cosmological evolution of sources.

- We show that cosmogenic neutrinos cannot be responsible of the observed diffuse neutrino flux, while the source neutrinos obtained in our study could reach the level of the astrophysical neutrino flux measured by IceCube, under some choices of the source parameters.