

VHE neutrinos and gamma-rays from dense clusters surrounding GRBs

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Massive stars with strong stellar winds are expected to be progenitors of the long gamma-ray bursts (GRBs). The winds of these stars are expected to form a wind cavities within the dense clusters. We consider a scenario in which protons, accelerated within the jet of GRB, escape from the GRB jet to the wind cavity. They are transported with the massive star wind to the dense open cluster where they interact with the matter producing high energy gamma-rays and neutrinos. It is argued that VHE neutrino (and possibly also gamma-ray) afterglows can be produced around observed GRBs for a long time after GRB explosion. Therefore, such emission might be detected in the stacked analysis of the VHE neutrino events (IceCube and Antares data) and possibly also VHE gamma-ray emission (e.g. in the HAWC data) around known GRBs.

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