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Probing a unified model for the origin of UHECRs and neutrinos with X-ray observations

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The generic unification model to account for the observed neutrinos with energies greater than ~ 100 TeV and UHECRs we had constructed can evaluate whether a given astronomical object class is qualified as the common origin of UHECRs and neutrinos. In this talk, we discuss which objects among the known astronomical class meet the criteria for UHECR accelerators in the unified UHE particle emission scheme. We argue that the most plausible candidates are transient objects associated with X-ray emissions in the optically thin environment. We present how the multimessenger observations by X-rays and neutrinos can place significant constraints on the parameters characterizing the UHECR-neutrino common sources such as the cosmic ray loading factor. It nails down the unifed origin or fully rules out the unification scenario. Searches for transient soft X-ray emissions sensitive enough to detect a X-ray object flaring at > 1e45 erg/s within a distance of 400 Mpc will provide a decent test of the low-luminosity GRBs hypothesis as the common UHE particle emission candidates.

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