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Gravitational Wave Follow-up of Ultra-High Energy Neutrinos with the Pierre Auger Observatory

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Primarily designed to detect ultra-high energy (UHE) cosmic rays, the Pierre Auger Observatory also possesses excellent sensitivity to UHE neutrinos. The Surface Detector array is used to search for highly inclined neutrino-induced air showers, which, though not observed yet, have clear characteristic signatures. Follow-up searches of UHE neutrinos in Gravitational Wave (GW) events are of unique scientific interest.

The fourth observational run (O4) by the gravitational wave network LIGO-Virgo-KAGRA of interferometric detectors started in May 2023. With the substantial increase in sensitivity in the O4 run, a higher frequency of GW alerts is expected. This creates a need for the development of software to reply to the General Coordinates Network (GCN) circulars. This talk presents the work being done by the Pierre Auger Collaboration to get an automated response to these GCN notices. Following the alerts, a specific analysis is conducted to calculate a one-day fluence limit for a point source, in the case no neutrino candidate was identified.

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