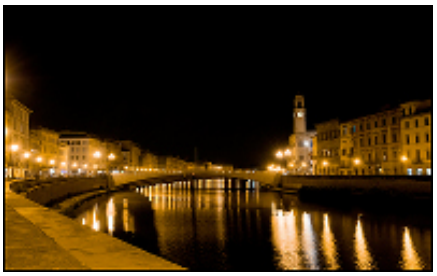

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# The Pierre Auger Observatory ultra-high energy neutrinos follow-up of the LIGO gravitational-waves events.

*Tuesday, 18 October 2016 17:00 (20 minutes)*

In early 2016 the LIGO and Virgo collaborations reported the breakthrough observation of the first gravitational-wave transient with the twin detectors of Advanced LIGO in September 2015 (event GW150914), followed three months later by the detection of GW151226. Both events are produced by the coalescence of black holes. Although no electromagnetic emission is generally expected from such events, in presence of magnetic fields and debris from the formation of black holes, radiation of ultra-high energy (UHE) neutrinos might be possible and, if detected, could help constraining the direction of the source of the events.
The Pierre Auger Observatory is capable of identifying air-shower events initiated by ultra-high energy neutrinos, using the data from its 3,000 km^2 surface grid of water Cherenkov detectors. The emission of neutrinos with energy > 100 PeV can be detected from point-like sources contained in the equatorial declination band between -65 and +60 degrees, including a portion of the 90% CL inferred position for GW150914 and GW151226. A search for neutrinos in temporal proximity with the GW events (and for the GW candidate event LVT151012) was performed, with time windows of +/- 500 s around ("coincidence") and 1 day after ("afterglow") the gravitational-wave events. Constraints to the energy radiated in UHE neutrinos are derived from the detection of no neutrinos in the search windows.

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