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Gd-loaded water Cherenkov detector as neutron veto for rare event searches.

One of the most dangerous background for Dark Matter and other rare event searches comes from neutrons generated by the radioactivity of the detector materials.

We recently designed, constructed and operated a neutron veto for the XENONnT experiment at LNGS, with the novel technique of a Gd-loaded water Cherenkov detector.

In this talk we will present the performances of the detector, operated so far with demineralised water only, and its prospects with the addition of Gd, to increase the neutron capture cross-section.

We will also describe the main characteristics of the new plant dedicated to purify the Gd-loaded water to keep a high transparency of the medium, while keeping the proper Gd concentration in solution.

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