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TeV Window to Grand Unification: Higgs's Light Color Triplet Partner

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The color-triplet partner of the Higgs doublet, called a T-particle, is a universal feature of Grand Unification. It has been shown some time ago that this particle can be accessible for direct production in collider experiments. In this talk we point out that the T-particle represents a simultaneous low-energy probe of baryon number violation as well as of the origin of the neutrino mass, linking the mediation of proton decay with oscillations of the neutron into a sterile neutrino. We point out a triple correlation between its collider signatures, proton decay measurements and the searches for the magnetic resonance disappearance of free neutrons in cold neutron experiments. In this way, the T-particle can provide a diversity of correlated experimental windows into Grand Unification.

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