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Lepton number, black hole entropy and 10^32 copies of the SM

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Lepton number violating processes are a typical problem in theories
with a low quantum gravity scale. Here
we examine lepton number violation in theories with a saturated black
hole bound on a large number of species. Such theories have been
advocated recently as a possible solution
to the hierarchy problem and an explanation of the smallness of neutrino
masses. Naively one would expect black holes to
introduce TeV scale LNV operators, thus
generating unacceptably large rates of LNV processes.
We show, however, that this does not happen in this scenario
due to a complicated compensation mechanism between contributions
of different Majorana neutrino states to these processes.
The phenomenology of such scenarios is discussed.

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