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Seesaw type I with Sizeable Deviations from 3x3 Unitarity

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A minimal extension to the Standard Model with three positive chirality neutrinos is devised, under the Seesaw Type I framework. A novel parametrization is exploited, which enables to control all deviations from unitarity through a single 3×3 matrix, which is denoted by X, that also connects the mixing of the light and heavy neutrinos in the context of type I seesaw. This parametrization is adequate for a general and exact treatment, independent of the scale of the right handed neutrino mass term. Examples with sizeable deviations from unitarity and heavy neutrinos with not very large masses are presented. The problem of possibly large one-loop mass corrections to the light neutrino masses is taken into account.

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