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On Naturalness in Type II Seesaw Models and the Heavy Higgs Masses.

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In the type II seesaw model, we derive the modified Veltman Conditions and show that quadratic divergencies at one loop can be driven to zero within a region of the parameter space of the model. The latter is severely constrained by a full set of unitarity and boundedness from below conditions, and by consistency with LHC measurements of Higgs decay to diphoton. Furthermore, we analyse the naturalness implications on the heavy Higgs masses and show how it affects their ranges of variation. More specifically, we obtain stringent upper limits about 288 and 351 GeV for the charged Higgs bosons H^\pm and $H^{\pm\pm}$ respectively, while the neutral Higgs H^0 and A^0 are found to be almost mass degenerate about 207 GeV.

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