# ARBITRARY PRECISION IN FLEXIBLESUSY

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Properties of multi-parameter particle physics models are usually explored using either generalized or dedicated computer software that allows to perform parameter scans and evaluate quantities of interest, like, the particle mass spectra or their decay rates. Numerical evaluation often faces the difficulty of huge separation of scales of the calculated quantities. Analytical evaluation takes this into account easily. However, the limited numerical accuracy causes problems when performing parameter scans as the huge scale differences could mean losing numerical precision up to the point where the result is random and, hence, useless. We have encountered this problem while working on the Grimus-Neufeld model [1] with the FlexibleSUSY [2, 3, 4] spectrum generator. The Grimus-Neufeld model is an extension of the Standard Model and uses the seesaw mechanism to generate the light neutrino masses. Due to the seesaw mechanism and extremely small masses of the light neutrinos the model can have scale differences of $10^{20}$ or even more. Hence, FlexibleSUSY cannot properly handle this difference with the usual `double` precision.

We tackle this problem by implementing arbitrary precision libraries in FlexibleSUSY. While there is still work to be done before this development is available officially and for any model, we present the proof of principle with the Grimus-Neufeld model as an example.

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