



Contribution ID: 237

Type: **Talk**

## A toolbox for diphoton model building

Hints for a new resonance at 750 GeV from ATLAS and CMS have triggered a significant amount of attention and many new models have been considered to explain the excess. Here we focus on several proposed renormalisable weakly-coupled models and revisit results given in the literature. We point out several physically important subtleties which are often missed or neglected. Accordingly, we motivate the use of automatised tools which can address those points raised, making simplifying assumptions unnecessary. To facilitate the study of the excess, we have extended the SARAH framework to automatically include crucial higher order corrections to the diphoton and digluon decay rates for both CP-even and CP-odd scalars. We have further extended the model database by 40 different models proposed in the literature to explain the excess. Finally, we demonstrate the power of the entire setup by presenting the study of a new supersymmetric model that accommodates the diphoton excess.

**Authors:** VOIGT, Alexander (DESY Hamburg); VICENTE MONTESINOS, Avelino (IFIC/CSIC, University of Valencia); Mr HARRIES, Dylan (University of Adelaide); STAUB, Florian (CERN); Mr NICKEL, Kilian (Bonn University); BASSO, Lorenzo (Institut Pluridisciplinaire Hubert Curien (FR)); UBALDI, Lorenzo (Tel Aviv University); Dr KRAUSS, Manuel E. (Bonn University); GOODSELL, Mark Dayvon (Ecole Polytechnique (FR)); ATHRON, Peter; OPFERKUCH, Toby (Universität Bonn)

**Presenter:** OPFERKUCH, Toby (Universität Bonn)

**Session Classification:** SUSY

**Track Classification:** Searches for Supersymmetry