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BSM phenomenology with FeynRules

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As the LHC turns on, and our theoretical models prepare to confront data, we need to be prepared to implement various models in monte carlo event generators for comparison. There is a large number of monte carlo generators on the market including CalcHEP/CompHEP, MadGraph, Sherpa, Herwig, Whizard and others. Each of these tools has different strengths and weaknesses and so it would be ideal if we could use each tool for the job it is best suited. In the recent past implementing a new model in just one of these event generators was a tedious and error prone task, in many cases requiring programming skills. Furthermore, once you finished building a model in one monte carlo package, it was not transferable to another and you had to start nearly from scratch. FeynRules is a Mathematica package which aims to overcome this challenge. The user of FeynRules implements a model in the FeynRules format. The lagrangian can be written in Mathematica notation in a form that is "close" to the way you write the lagrangian on paper. FeynRules then reads this FeynRules model-file, creates the Feynman rules and stores the information in a monte carlo program independent format. This information is then general enough to be used by any monte carlo package as well as symbolic packages and TeX. All that is necessary is a translation to the respective language. Such translation interfaces have been written for TeX, FeynArts, MadGraph, Sherpa, and CalcHEP/CompHEP. We hope to add interfaces to other monte carlos in the future.

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