



Current status

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On behalf of *CompHEP* Collaboration

Current status

- Introduction
- New version: CompHEP-4.2
 - New features
 - New modules
 - GNU tools for development
 - Bug fixing
- Future development

Introduction

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- CompHEP is a program for calculation of differential cross sections and MC generation of events flow.
- CompHEP uses the squared matrix element technique: exact (symbolic) calculation of $|M|^2$
- CompHEP uses Vegas MC integrator.
- The new version is based on the source files of version 4.1.10
- CompHEP Collaboration: E.Boos, V.Bunichev, M.Dubinin, L.Dudko, V.Edneral, V.Ilyin, A.Kryukov, V.Savrin, A.Semenov, A.Sherstnev

Introduction (cont.)

- Main features.
 - User friendly interface
 - Predefined main particle physics models
 - New models defined by users
 - Automatic generation of Feynman rules from Lagrangian by LanHEP.
 - Symbolic (exact) calculation of differential cross sections
 - MC integration
 - Event flow generator
 - Histogramming

CompHEP-4.2

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- Calculated processes
 - 2->n (n=2,...,6) hard subprocesses in SM
 - 2->n (n=2,...,4) for MSSM, GMSB and SUGRA
 - 1->n (n=1,...,5) particle decays.
- New models
 - New particle notation (incompatible with old versions)
 - MSSM model (both in Feynman and unitary gauge)
 - SUGRA model (unitary gauge)
 - GMSB model (unitary gauge)
 - # model: u#d# model, q# model. Simplification of quark combinatorics in SM.

CompHEP-4.2 (cont.)

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- New event format.
 - Les Houches 2001 standard.
 - Unified format for both single subprocess event flow and mixed event flow
 - Extendable, flexible format. Easy updating for future requirements.
 - New version of the mixing utility
- MCDB: MC event data base (LCG subproject).
- CompHEP - Pythia interface
 - Colour chains

CompHEP-4.2 (cont.)

- Includes LanHEP as a standard module of CompHEP
- New parton distribution functions
 - CTEQ6L, CTEQ6M
- New utilities
 - Symbolic batch mode (symb_batch.pl)
 - Numeric batch mode (num_batch.pl)
 - Reweighting of event flow
 - Smoothing of histograms

CompHEP-4.2 (cont.)

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- New WEB home page:
<http://theory.sinp.msu.ru/comphep>
- Other improvements
 - Speed up of calculation with PDF.
 - Reshuffled structure of menu
 - New documentations (but not much enough)
- GNU tools for maintenance
 - CVS system
 - Make utility
- Fixed bugs

Future development

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- Short term plan
 - Form factors
 - Implementation of effective vertices with 3-d and 4-th legs.
 - Parallel calculation of subprocesses
 - PBS/LSF/GRID
- Long term plan
 - FORM
 - Replacement of the symbolic calculator
 - New (amplitude ?) technique
 - New GUI

CompHEP Collaboration (incomplete list)

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CompHEP

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