Report from the generator group

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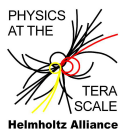

Outline

The generator group

- Since the end of the GDE: Informal group.
- Members:
  - MB and J. Tian (ILD gen. group conveners)
  - P. Roloff (CLICdp)
  - SiD: T. Barklow (SiD)
  - + others: A. Miyamoto, J. Stube, D. Jeans, M. Habermehl, M. Vos,...
- Main task
  - Interact with generator authors
  - Validate
  - Set up common framework
- In view of a new mass-production of the entire SM (as background or signal).
- For at least ILD and CLICdp: ready to go in summer.

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Whizard2.6 status

- Whizard remains the generator of choice for e^+e^-.
- DBD was done with v. 1.95
- v2.x is a major re-write. Many new features.
  - New, better steering
  - Things done by us now part of the main code:
    - Interface to PYTHIA (parton-shower and hadronisation)
    - Interface TAUOLA (polarised τ decays)
    - Outputs STDHEP
    - Beam-spectrum
  - Internal parton-shower with matching of gluons between hard process- p.s.- hadronisation.
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    - Problem with hadrons in 4f solved: The di-jet mass now shows the expected Z and/or W Breit-Wiegner's, once the right settings are done.
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- The severe problem with the treatment of ISR was corrected. The treatment now is identical to the W1.95 treatment (still not perfect, but as good as it gets).
  - A caveat is that this treatments needs two ISR:s to play with, to assure CPT. This means that the P_T-kick from ISR will be missing in the case there is only one possible ISR, ie. when one of the beam-particles is a real photon.
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Other generators

In general it would be nice to also have other generators, but currently not much push for it.

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- BDK/BDKRC for $\gamma\gamma \to \ell\ell$
- Pythia8, MadGraph for double-checks.
- Pythia8 instead of Pythia6 for hadronisation.

Problem @ Tokyo meeting: How to get output into LCIO?

- "Output" often HepMC or Les Houches
- Idea to test: Whizard can take these as input, and can output LCIO.
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ILC Generation production

Which samples to produce ?

- 250, 350, 500 - at least H20 - up to 10 times as much
- Higgs: as in DBD: separated out from SM sample (use infinite m_h in SM sample)
- Z pole
- produce all samples with fully polarised beams.
- Maybe: produce some “standard” BSM benchmark samples? If so: What ?
- Special calibration samples, centrally produced.
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Estimate of time/effort:

- Once Whizard is fully validated
  - Largest fraction of generation is the initial integration
  - Runs on single computer - afterwards producing large sample is fast
    - New feature in 2.0.0: Multi-core integration. Can make the dijet-ILC impossible integration of $2 \to 8$ processes tractable. Speed vs. # processors roughly linear.
  - Only disk-space might be an issue, but here the switch from un-compressed 64bit stdhep output to compressed 32bit LCIO output is expected to help a lot.
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  - SGV is used to do this.
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- Created at job submission
- Contain: process, cross section, polarisation, files, ...
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Show-stoppers @ Lyon

Non-trivial issues:

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- Colour-flow transfer Whizard/Pythia

Trivially fixed issues:

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- Decay codes in LCIO output (Already fixed in latest α)
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  - Keep the input - by Geant un-modified - MCParticle collection down-stream?
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