Simulation Tools, Data Sets & Tutorials for Snowmass - Status

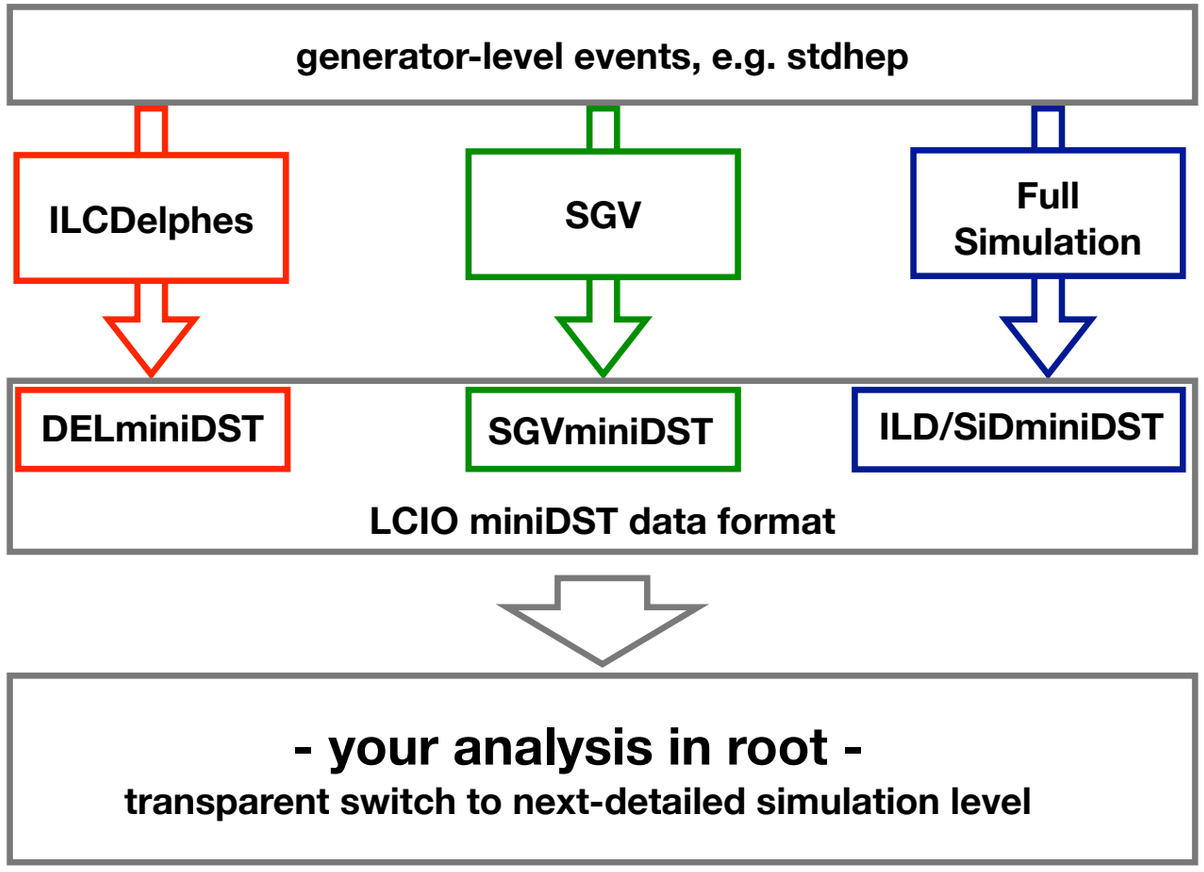
J. List,

LCC Physics WG Snowmass TF meeting

August 25, 2020

Overview of Activities

- LCC Physics WG & friends: "Study Question" Document
- ILC Delphes card (F. Zarnecki et al)
- delphes2lcio (F. Gaede)
- miniDST (S. Kawada et al)
- SGVminiDST (M. Berggren)
- examples (F. Gaede, J.List): https://github.com/ILDAnaSoft/miniDST
- **central point of entry: https://ilcsnowmass.org**



Status of Delphes-based miniDSTs

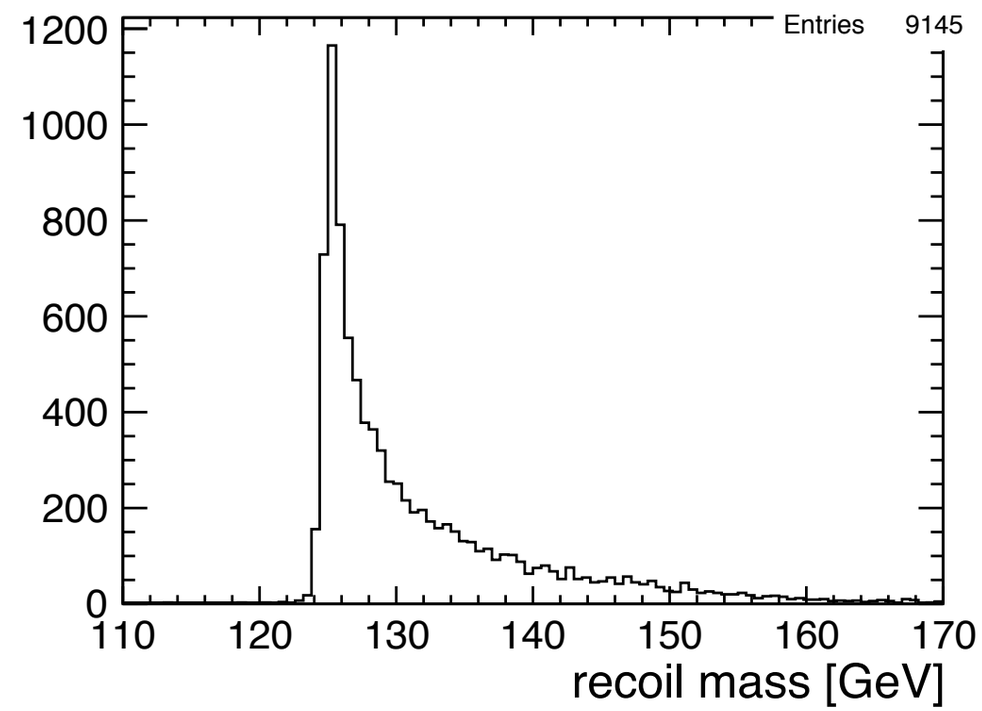
- "generic ILC detector" Delphes card (F. Zarnecki et al):
  - defined, stable & released to Delphes authors: https://cp3.irmp.ucl.ac.be/projects/delphes/browser#git/cards/ILCgen
- delphes2lcio
  - creates miniDSTs from Delphes
  - current production version in lcio v02-15-02: https://github.com/iLCSoft/LCIO/tree/master/examples/cpp/delphes2lcio
  - latest addition: set cross-section and beam polarisations to store in LCIO event header
    => luminosity & polarisation normalisation works identical to full sim data
  - maybe some special handling for extreme low multiplicity events required => WIP
  - "normal" ee->2f, … events can be produced, Chris completed test processing of 10k events / process

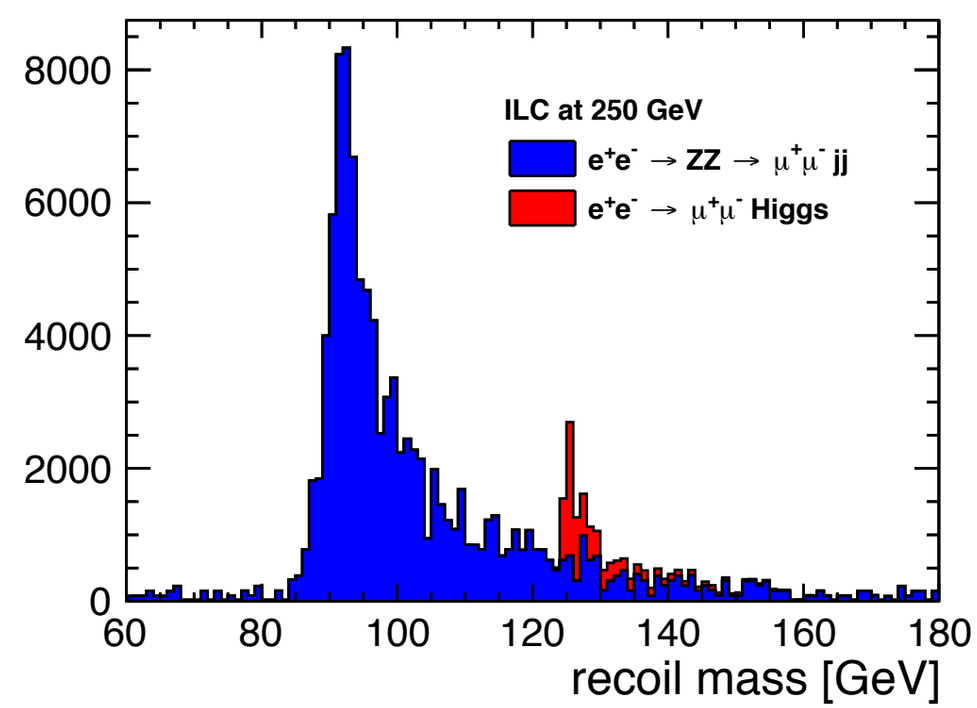
Status of SGV-based miniDSTs

- plan to provide SGVminiDSTs of upcoming new 250 GeV production
- also useful for us since full simulation of 10 ab-1 will take time…
- first goal: subset production with 10k of ee-> 2f / 4f / ff Higgs process
  - produced SGVminiDSTs for ee-> 2f / 4f
  - ff Higgs: generated, SGV and miniDST processing underway
  - when done: upload to OSG
- as full 250 GeV event generation proceeds, more SGVminiDSTs will be added
- would be extremely useful if a DESY person (Mikael ?) could get write access to 50TB @ SLAC

Status of Example Pages

- c.f. https://github.com/ILDAnaSoft/miniDST
- installation instructions for OSG (or any system with /cvmfs mounted)
- examples:
  - Higgs recoil peak (1) with signal only, “raw” MC events
  - Higgs recoil peak (2) with signal and background correctly normalised to luminosity & polarisation
  - b-likeliness for each jet
- excercise:
  - **Higgs recoil peak (2) with cut on b-likeliness**





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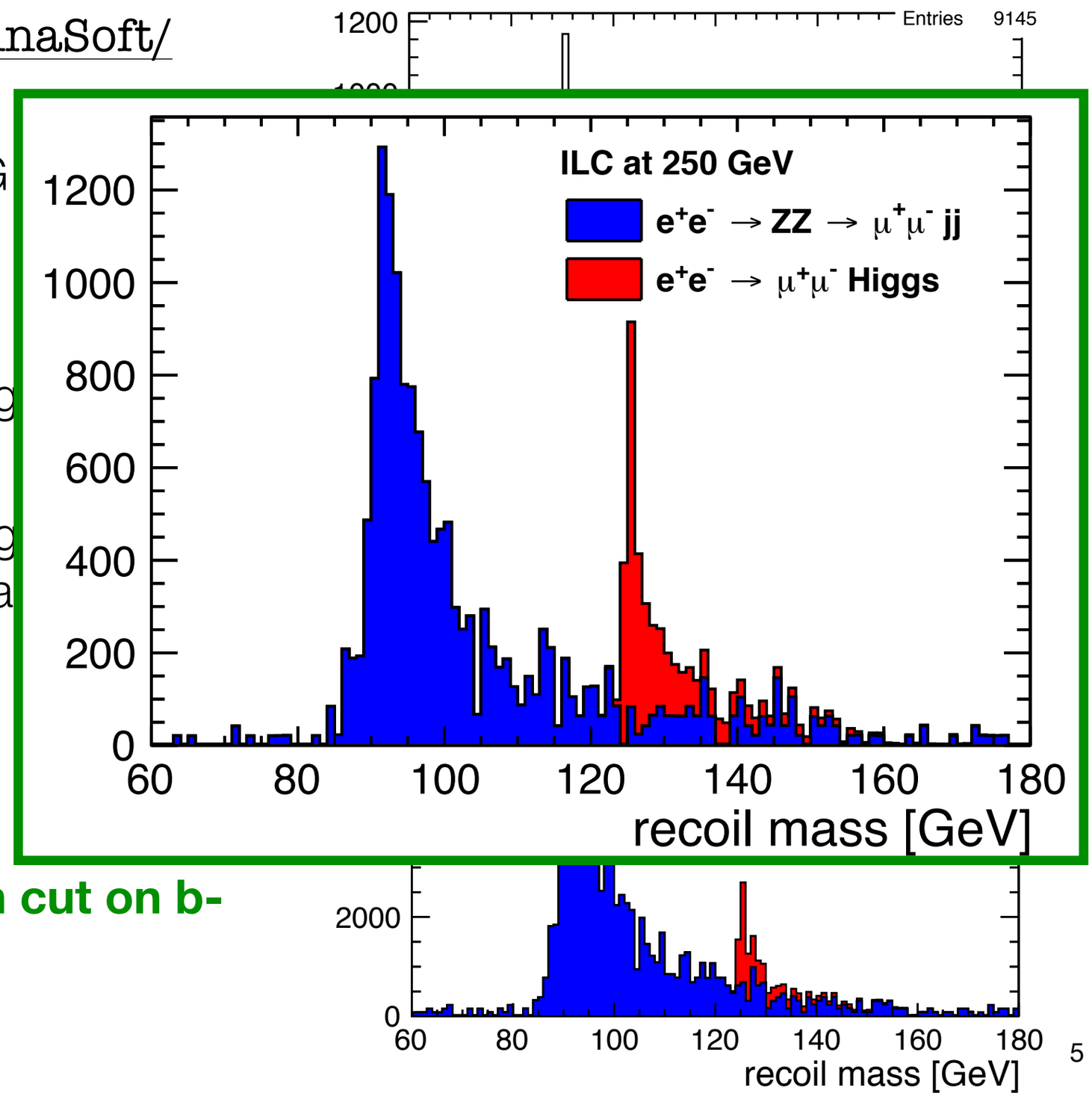

Tutorials

- Chris Potter, Jan Strube, F. Gaede, R.Ete, D.Jeans, N.Graf, JL
- offer a first tutorial this Friday:
  - https://indico.fnal.gov/event/45031/
  - so far 24 registrants
- offer follow-up tutorials in September
  - based on feed-back from first tutorial
  - repetition and/or advanced level (e.g. Marlin ?)
  - more details on e+e- analysis techniques?

Content of First Tutorial

1. introductory slides
   - based on “Study Questions” document
   - overview of iLCSoftware tools & data sets we offer / plan to offer
   - some basic dos and don'ts of e+e- analysis
2. your first Higgs recoil plot
   - based on https://github.com/ILDAnaSoft/miniDST
   - have seen result on slide 5…
   - in addition: as jupyter notebook (J.Strube): https://github.com/jstrube/LC_with_Julia_examples/tree/main/Snowmass
3. running delphes2lcio yourself
   - mainly targeting colleagues who'd like to run delphes2lcio on any stdhep file from their favorite generator / BSM model / ...

Conclusions

- still a few loose ends to tie up
- but: we're getting there…
- …thanks to an enormous effort by all involved people!