Physics and Software Meeting

Akiya Miyamoto

KEK

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Update of JSF

- **JSFGeneratorParticle: add new member, fKI4 and fKI5**
  - ◆ store K(I,4) and K(I,5) of /PYJETS/ as it is.
  - ◆ K(I,4) and K(I,5) store line numbers of first and last children.
  - ◆ But, if ks=3, 13, 14, 42 or 52, color flow information is stored in special format.
    - ● Ex. K(I,4) =200000000*MCFR+100000000*MCTO+10000*ICFR+ICTO if ks=3,13,14.
  - ◆ JSF conversions between PYJETS and HEPEVT was troublesome.
  - ◆ new info will reduce problems
- **JSFHadronizer:**
  - ◆ if ks=3,13,14, ICFR and ICTO (or C1 and C3, if ks=42, 52) are used to as line numbers of first and last children.
    → Is this correct ? need further check
  - ◆ JSFHadronizer::Fragmentation is being modified accordingly.
    - ● K(I,1) (status), K(I,4), K(I,5) from /PYJETS/ are copied to JSFGeneratorParticle
    - ● Particle position in /PYJETS/ are copied to JSFGeneratorParticle
    - ● Question: Shall we copy JSFSpringPartons in JSFGeneratorParticle ?
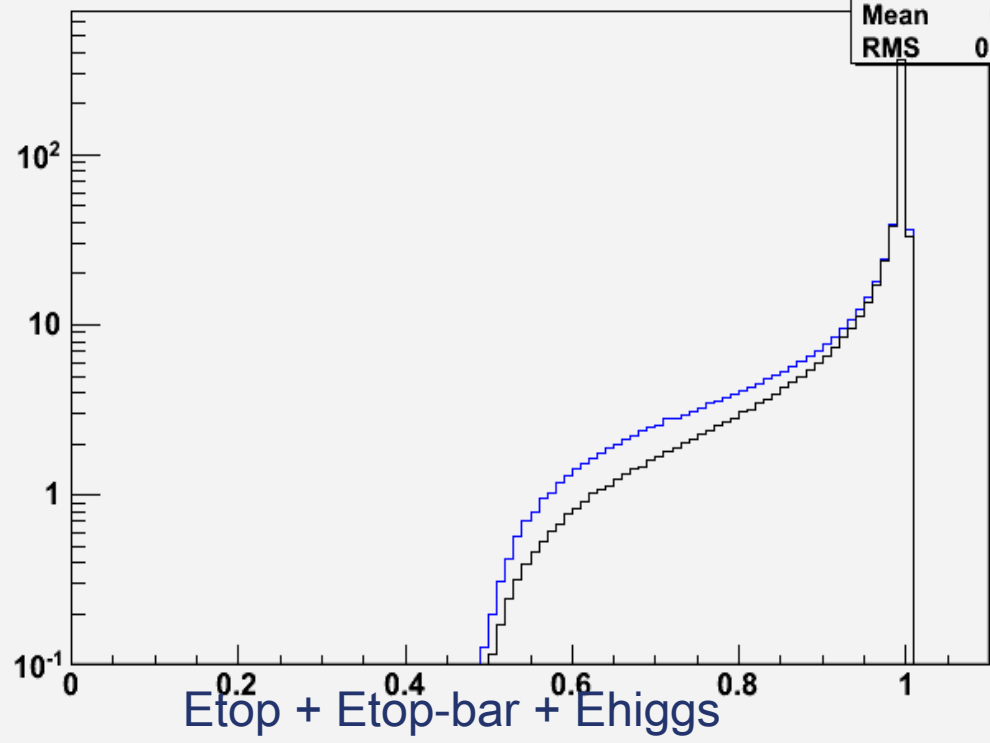- **JSFWriteStdHep : modification in progress**

Tauola for ttH

- Two interfaces, from demo-standalone and demo-pythia.
    - standalone mode is used for prompt tau decay in JSFHadronizer.
    - pythia mode is used for tau decay during hadronization,
       ex. H→tau+tau- or semi-leptonic decay of c/b quarks
    - /HEPEVT/ for pythia and /HEP_EVT/ for standalone

- To achieve this,
    - Two routines for interface, ex FILHEP and FILHEP_SA
    - COMMON /TAUOLA_MODE/ IS_STANDALONE
       FILHEP calls FILHEP_SA if IS_STANDALONE==1

- libtauola for physsim is different from libtauola for Whizard
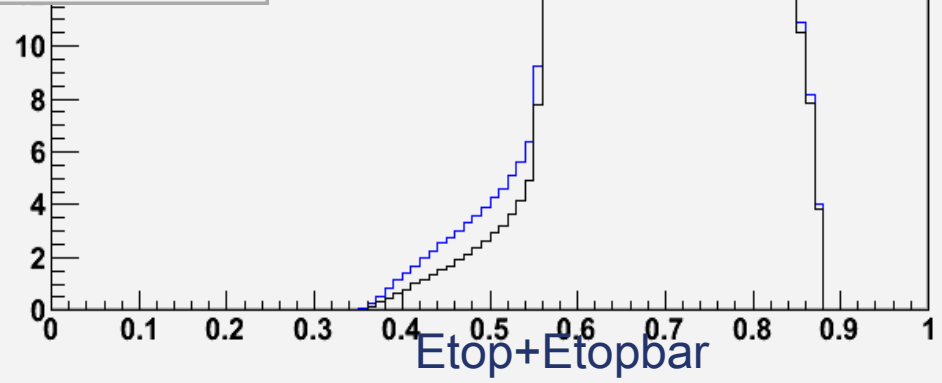 lclib/generator/tauola will be replaced later

ISR for ttH

- **isr_function.F : ISR weight a la Whizard**

- **isr_remnants.F:**
  - generate γ of ISR photons a la Whizard, incl. pt
  - two γ per event.

- **Total cross section**
  - Physsim ttH old ISR   :   6.646 +- 0.0033 fb
  - Physsim ttH new ISR   :   6.1055 +- 0.003 fb
  - Whizard tree   :   6.01409 +- 0.00983 fb

E_(ttbarh)/E_bm

h19BS	
Entries	9474520
Mean	0.9515
RMS	0.09293

Etop + Etop-bar + Ehiggs

Black: New Physsim
Blue: old physsim

incl. ILC 1 TeV beamstrahlung

h18BS	
Entries	9474520
Mean	0.6896
RMS	0.1017

Etop+Etopbar

Black: New Physsim (scaled)
Blue: old physsim

incl. ILC 1 TeV beamstrahlung