

Few thoughts as a contribution to discussion



- Happy for this hand-shake meeting : we think revamping the LHC HF WG will be very useful for the HF community (Belle-II could be also involved - to be discussed)
- We may start preparing formal WG meetings on different topics aiming to review state-of-art tools and analysis methods, **by comparing LHC experiments and identifying issues and solutions in the framework of a common/shared strategy.** (EvtGen can be a good start; other items have been proposed, for instance the binning choice for $b \rightarrow s \ell \ell$)

Next slide dedicated to **EvtGen**

- An example of the need to adopt a common strategy : allow **homogeneous** comparison of $R(D^*)$, $R(D)$ results - **an aligned backgrounds' description seems essential** (to account for sources of D^* and D^{**})



EvtGen usage in CMS - I

➤ Generation of events with beauty and charm hadrons:

Pythia8.x or **BCVEGPY** or anything else interfaced to Pythia (for hadronization)
+ **EvtGen** or any other *external decayer* (**Tauola**, **Photos**,...)
[we use standard versions with no special modifications]

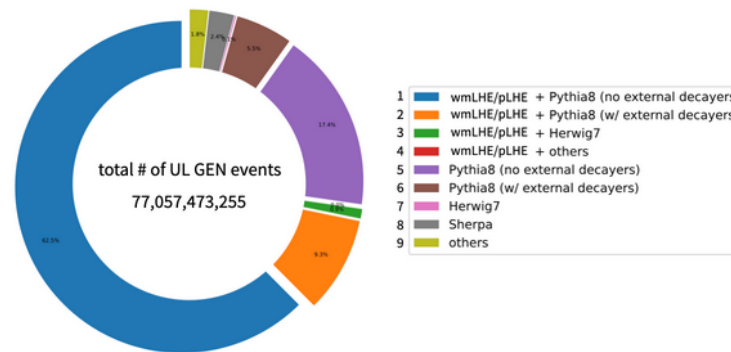
The choice of **EvtGen** impacts the description of b-jets and thus also higher- p_T physics than “HF domain”

➤ In production for Run-3 (our latest version): **EvtGen2.0**, which also involves :

- TAUOLA++ 1.1.8
- PHOTOS++ 3.64
- HepMC 2.6.10
- PYTHIA (at least 8.243)

➤ General interplay with Pythia

GEN process (by Aug 2021), we have the following pie chart.





- Issues: - stable official releases behind/not updated w.r.t. physics modelling
(induces experiment-specific versions)
- CMS-specific: low efficiencies imply very high computing resources, in general not affordable for BPhysics only; multithreading methods in the event generation step have not solved the problem so far.

In some cases/analyses EvtGen is not essential and Pythia could be used with specific “hooks”
(technically not-easy though; user-specific potentially bug-prone thus requiring double-checking)