

Some thoughts for (far) future of LHCf

Y.Itow

Congratulations, us !

- We have now completed the program originally proposed 15years ago.
- UHECR situation: Now likely mixed composition / light ion scenario.

However..,

- Cosmic interaction models need to be tuned
- LHCf data analysis will continue for another 10 years.

Next step

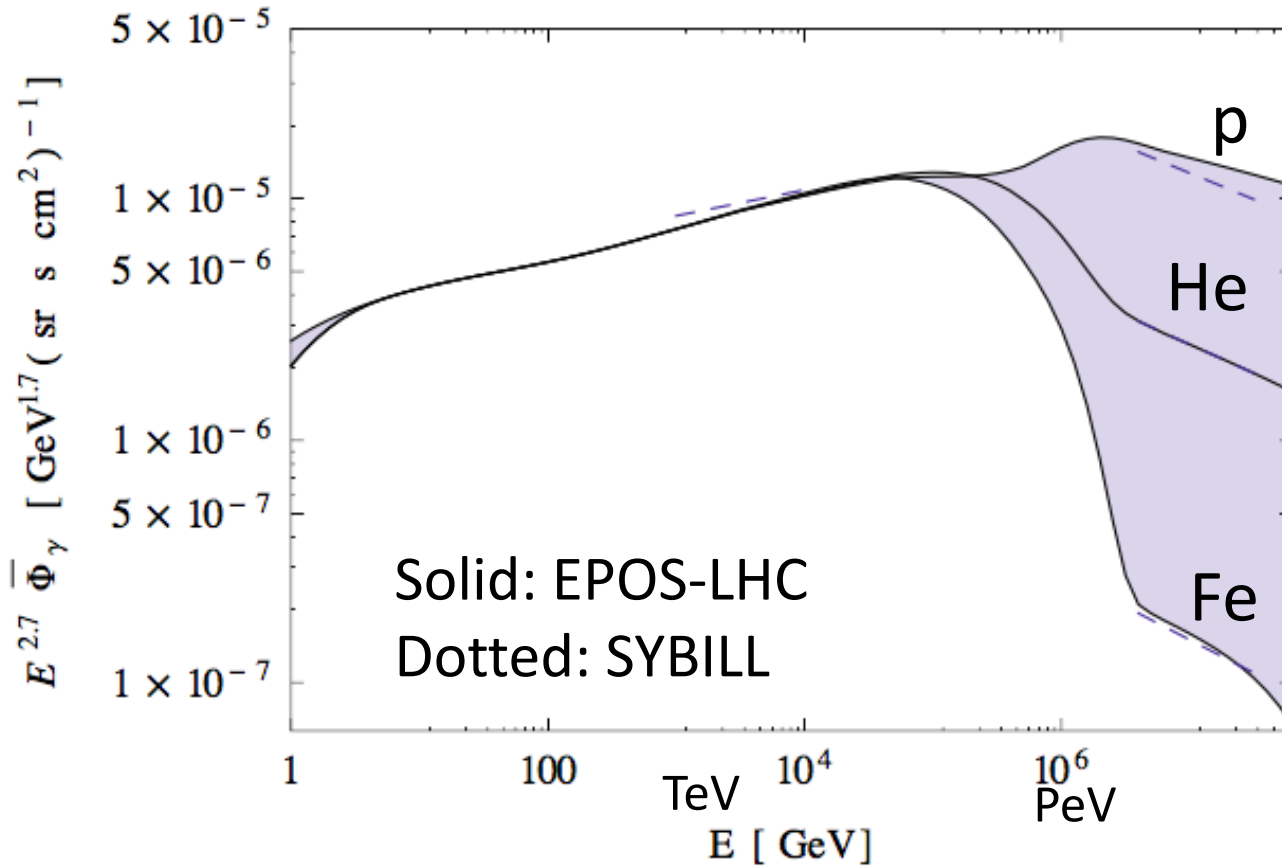
- p-0 run, sometime in “near” future
- Let’s prepare;
 - Submit LOI to LHCC for p-0 run with new LHCf
 - Pixel based position detector
 - Modern DAQ integrated into ATLAS-DAQ
 - Switch from VME ADC and scifi-FEC

Extend physics interests

- Not only UHECR air showers, but also showers in interstellar medium
- Gamma-ray astronomy
 - Diffuse PeV γ -rays production by CR proton/ions
 - Forward γ spectra in pp and A-p at $\sqrt{s} \sim 10\text{TeV}$
- Neutrino astronomy
 - IceCube sub-PeV astrophysical neutrinos
 - Atmospheric prompt ν background
- Fix target (lower energy)
 - Gas-jet in LHC
 - SPS, PS fix target program (NA61, etc)
 - Atmospheric neutrino flux in 10 GeV for oscillation study
 - Also for LBL program (T2HK, DUNE)

Diffuse γ from galactic plane (CR p, He, Fe interaction with matter)

J.M. Carceller, M. Masip
arXiv:1610.02552



At the same visible CR energy E ,
Nucleon energy is E/A