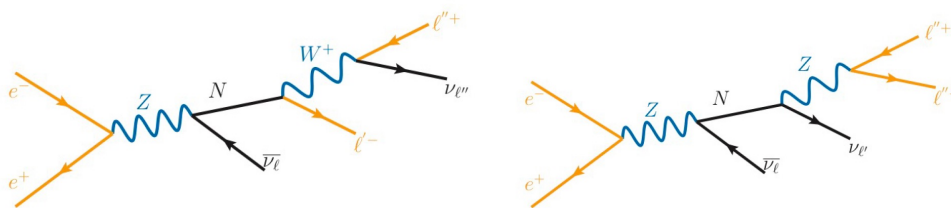


# LLP with CLD Fullsim And ALP Pheno

Gaëlle Sadowski, Meena Meena,  
Jeremy Andrea,  
Auguste Besson, Ziad ElBitar  
(IPHC, CNRS, Strasbourg)

## Goals :

- Perform HNL analysis, similar to 2203.05502 but with FullSim.
- Study the impact of different (vertex) detector designs on the physics performance.

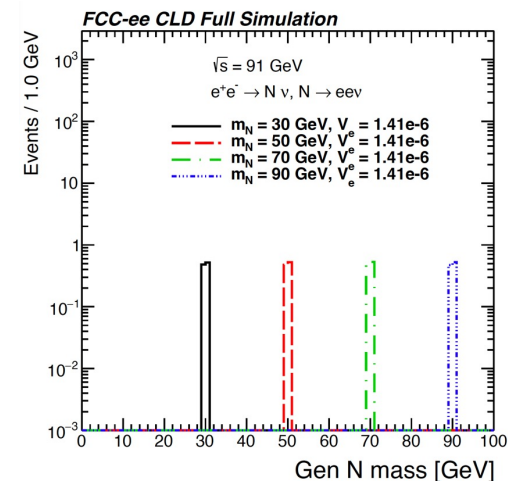


## Status :

- Signal generation of HNL,
- Full simulation and reconstruction,
- Proto-Analysis implemented in FCCAnalysis,
- Issues of performance in electrons PF reconstruction.

## Next steps :

- Find a solution for electron reconstruction (track only simplified ID ?), waiting for bugfix,
- Generate benchmark points,
- Generate background samples (central?),
- Implement final analysis, compute sensitivity.

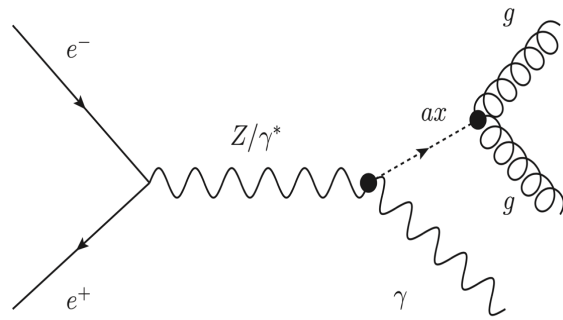


Meena Meena

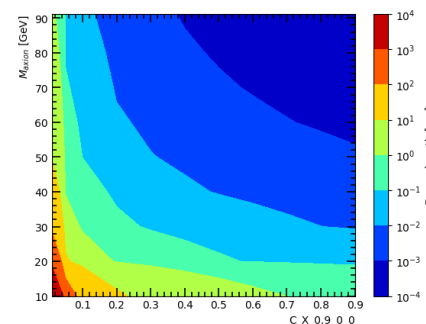
- Search for Axions at FCCee:

- Production of a photon and a LLP axion decaying into a pair of jets.

arXiv:1701.05379



Parameters :  $C_{\tilde{g}}, C_{\tilde{W}}, C_{\tilde{B}}, C_{\varphi}, m_{alp}$



- First pheno study:

- Determination of the parameter space of interests.
- “high enough” cross sections, decay-length within the tracker volume,  $Br(ax \rightarrow gg)=100\%$ ,
- Do fastsim pheno study (publication by the end of the year ?) then move to fullsim (next year ?).

- Status/plan :

- Validation of the pheno models (almost done),
- Choice of benchmark points (ongoing),
- First events selection implemented (MadAnalysis),
- Move to official FCC Fastsim cards (CLD),
- Events selection and sensitivity calculation.

