Simulation requests – exclusive and diffractive WG

- EIC Detector 1

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EIC Detector-1 Simulation, Production, QA - Planning

- **Synopsis**

[Describe the main goals between now and CD-2/3a. Describe the overall strategy of your working group in its transition towards a single software stack.]

- Response:

[we should discuss.] e.g., all manpower on one software stack? (for example, DD4HEP), give "bottle-neck" observable priority, train new people, etc.

Current requests list Who's contact person?

- Google sheets to collect input:
https://docs.google.com/spreadsheets/d/1bLA2vD_0i0WO7niqDcIDtV4DOrjF3jxgQHSGLt0OmPQ/edit?usp=sharing

- Diffractive VM, DVCS ep, TCS ep, Upsilon threshold production (1s,2s,3s). Need more people to fill in the form with existing samples.

- All samples have been "burned" by beam-related effects and crossing angle of 25mrad.

- All samples that are on the list now were from ATHENA. These are in ready-to-go status.

- **Deadline: until the end of this week to compete the list; so, go to the link and add!**

Software Stack:
DD4HEP

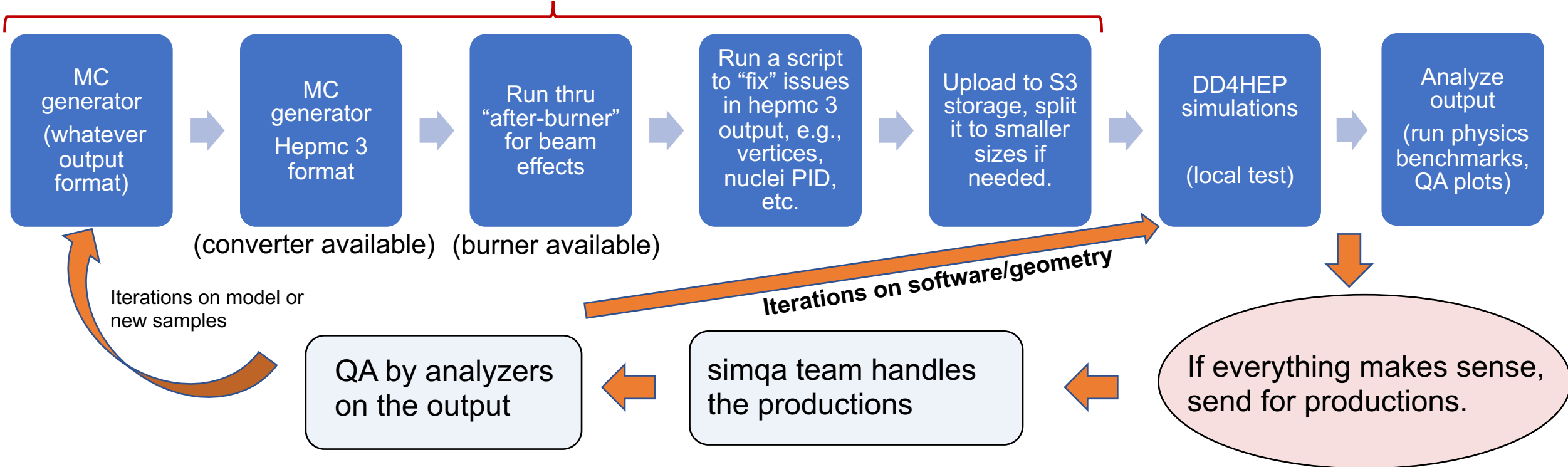| Sartre samples	System	energy	Q2	VM	Breakup	Statistics	helicity	S3 location
1	eAu	18x110	>1	J/psi -> ee	coherent	10M	N/A	eictest/ ATHENA / EVGEN / EXCLUSIVE / DIFFRACTIVE_JPSI_ABCONV / Sartre / Coherent / sartre_bnonsat_Au_jpsi_ab_eAu_1.hepmc
	eAu	18x110	>1	J/psi -> ee	incoherent	10M	N/A	eictest/ATHENA / EVGEN / EXCLUSIVE / DIFFRACTIVE_JPSI_ABCONV / Sartre / Incoherent/ sartre_bnonsat_Au_jpsi_ab_eAu_1.hepmc
2	eAu	18x110	>1	Phi -> KK	coherent	10M	N/A	eictest/ ATHENA / EVGEN / EXCLUSIVE / DIFFRACTIVE_PHI_ABCONV / Sartre / Coherent / sartre_bnonsat_Au_phi_ab_eAu_1.hepmc
	eAu	18x110	>1	Phi -> KK	incoherent	10M	N/A	eictest/ ATHENA / EVGEN / EXCLUSIVE / DIFFRACTIVE_PHI_ABCONV / Sartre / Incoherent / sartre_bnonsat_Au_phi_ab_eAu_1.hepmc
BeAGLE samples								
3	eAu	18x110	>1	Phi -> KK	incoherent	20M	N/A	eictest/ ATHENA / EVGEN / EXCLUSIVE / DIFFRACTIVE_PHI_ABCONV / BeAGLE/*.hepmc
EpIC samples	*(pay attention to the _novtx.hepmc, related to issue #2)*							
4	ep	18x275	>1	Photon	DVCS.coherent	1M	N/A	eictest / ATHENA / EVGEN / EXCLUSIVE / DVCS_ABCONV / 18x275 / *.hepmc
	ep	10x100	>1	Photon	DVCS.coherent	1M	N/A	eictest / ATHENA / EVGEN / EXCLUSIVE / DVCS_ABCONV / 10x100 / *.hepmc
	ep	5x41	>1	Photon	DVCS.coherent	1M	N/A	eictest / ATHENA / EVGEN / EXCLUSIVE / DVCS_ABCONV / 5x41 / *.hepmc
5	ep	18x275	>1	e+e-(?)	TCS.coherent	1M (?)	plus	eictest / ATHENA / EVGEN / EXCLUSIVE / TCS_ABCONV / 18x275 / hel_plus
	ep	10x100	>1	e+e-(?)	TCS.coherent	1M (?)	plus	eictest / ATHENA / EVGEN / EXCLUSIVE / TCS_ABCONV / 10x100 / hel_plus
	ep	5x41	>1	e+e-(?)	TCS.coherent	1M (?)	plus	eictest / ATHENA / EVGEN / EXCLUSIVE / TCS_ABCONV / 5x41 / hel_plus
6	ep	18x275	>1	e+e-(?)	TCS.coherent	1M (?)	minus	eictest / ATHENA / EVGEN / EXCLUSIVE / TCS_ABCONV / 18x275 / hel_minus
	ep	10x100	>1	e+e-(?)	TCS.coherent	1M (?)	minus	eictest / ATHENA / EVGEN / EXCLUSIVE / TCS_ABCONV / 10x100 / hel_minus
	ep	5x41	>1	e+e-(?)	TCS.coherent	1M (?)	minus	eictest / ATHENA / EVGEN / EXCLUSIVE / TCS_ABCONV / 5x41 / hel_minus
eSTARLight samples								
7	ep	18x275	<1	Upsilon 1s	Coherent	50k(?)	N/A	eictest / ATHENA / EVGEN / EXCLUSIVE / UPSILON_ABCONV / upsilon1sphoto_ab_hiAcc_18x275_NEW.hepmc
8	ep	18x275	<1	Upsilon 2s	Coherent	50k(?)	N/A	eictest / ATHENA / EVGEN / EXCLUSIVE / UPSILON_ABCONV / upsilon2sphoto_ab_hiAcc_18x275_NEW.hepmc
9	ep	18x275	<1	Upsilon 3s	Coherent	50k(?)	N/A	eictest / ATHENA / EVGEN / EXCLUSIVE / UPSILON_ABCONV / upsilon3sphoto_ab_hiAcc_18x275_NEW.hepmc
lAger samples								

Future requests

- MC samples from this group seem to be stable and should be used in the future requests.

- Changes are more on the geometry/detector side (?)

- Benchmarks are to be run again and again.

Simulations and Physics Benchmarks

Mostly only need once

| MC generator (whatever output format) | MC generator Hepmc 3 format | Run thru "after-burner" for beam effects | Run a script to "fix" issues in hepmc 3 output, e.g., vertices, nuclei PID, etc. | Upload to S3 storage, split it to smaller sizes if needed. | DD4HEP simulations (local test) | Analyze output (run physics benchmarks, QA plots) |

(converter available)   (burner available)

Iterations on model or new samples

Iterations on software/geometry

QA by analyzers on the output

simqa team handles the productions

If everything makes sense, send for productions.

We (I) encourage everyone takes similar/identical approach for every benchmark (except analysis specific codes).

Everyone who has learned to use should have one *"homework"* – teach at least another person