

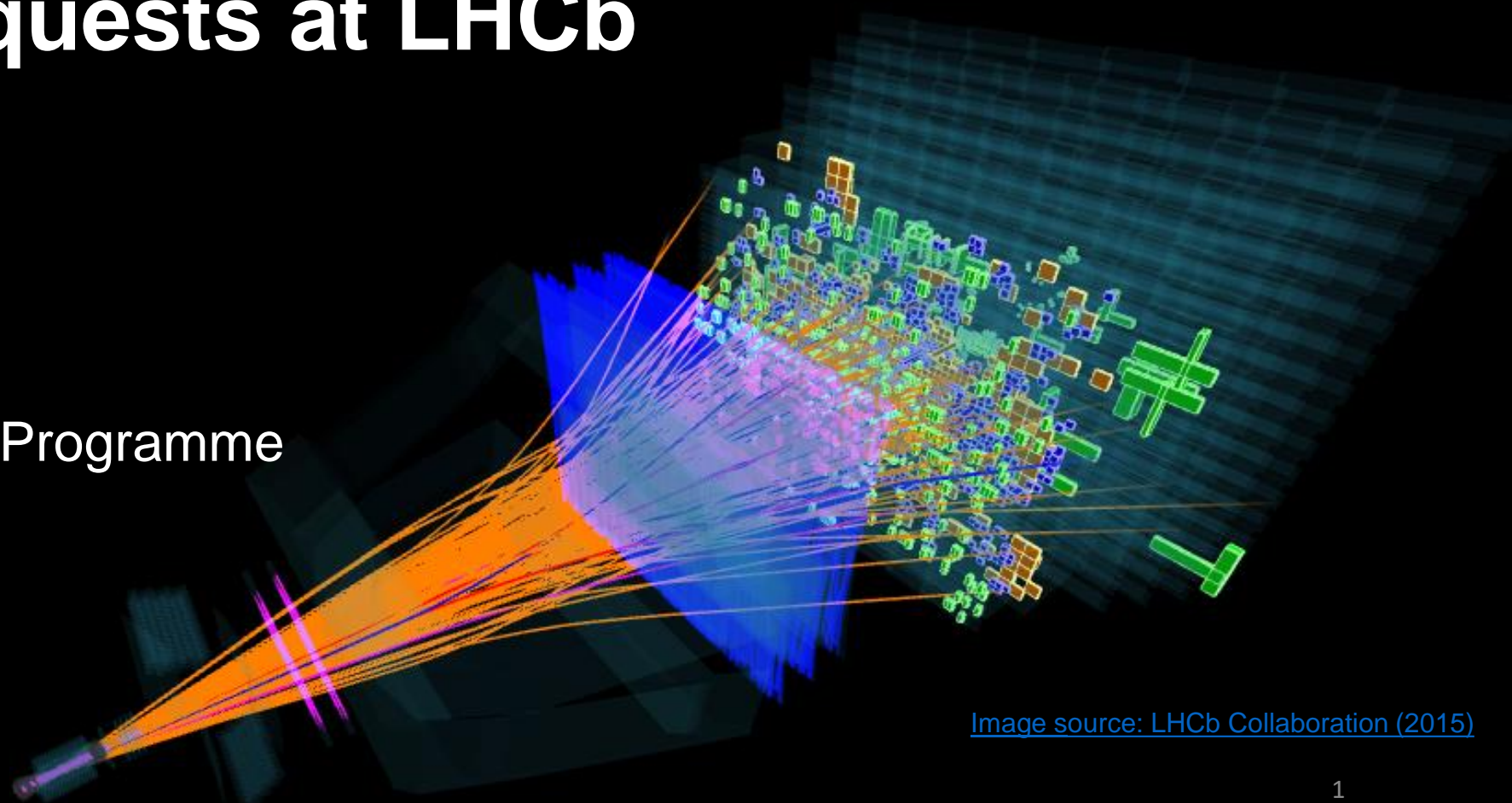
Improving LbMCSubmit

A simpler way to specify simulation requests at LHCb

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[Image source: LHCb Collaboration \(2015\)](#)

LHCb simulation productions

- Simulations done on the grid
- Production requests submitted via web interface
- Same information must be filled in many times for similar production requests
- No way to do bulk edits to requests
- When new software version is released, model production requests must be updated manually
- Hours of work
- Error-prone

Edit step 158925

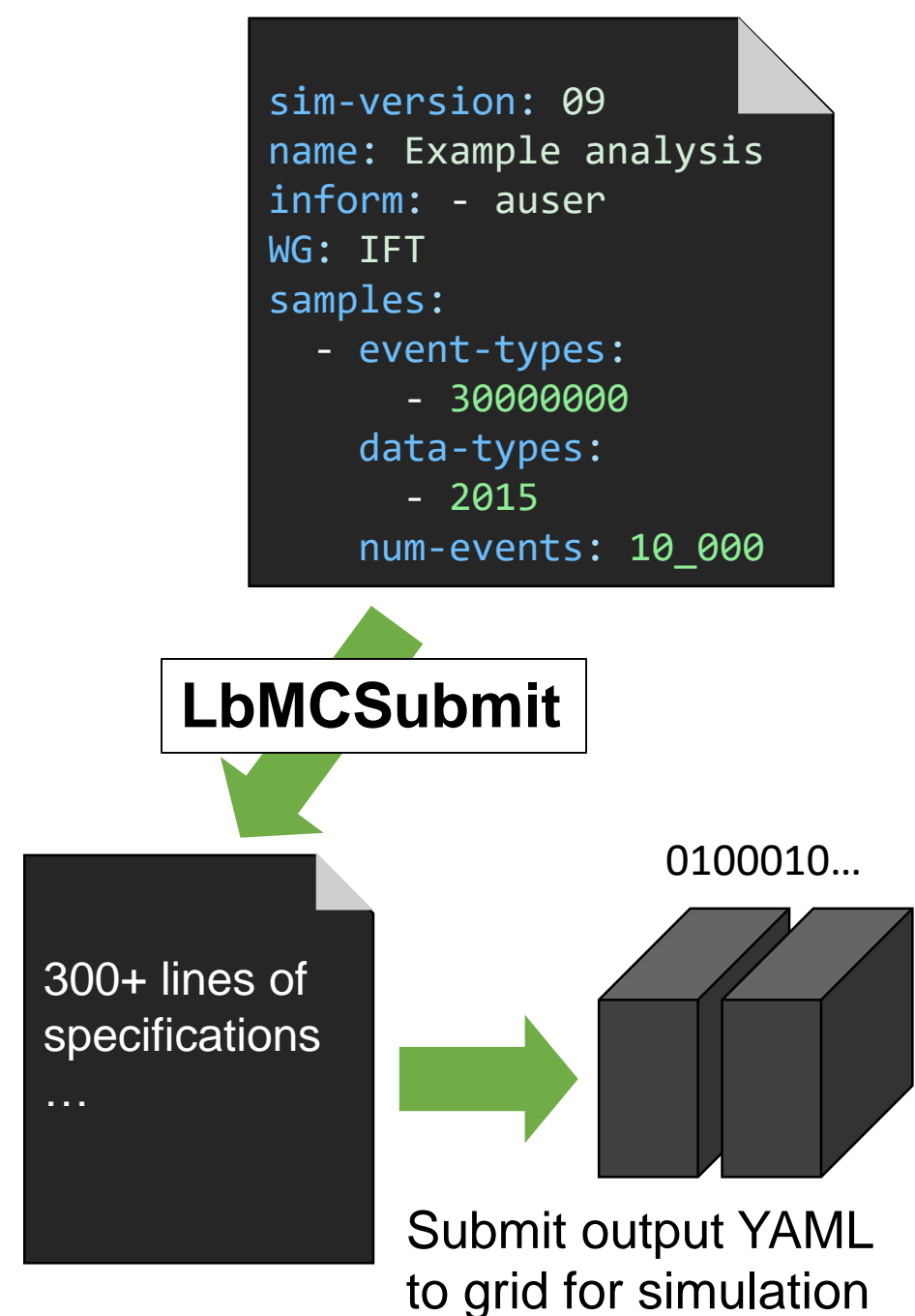
Name:	Sim09I - 2017 - MD - pNe - 2510GeV - PVZ+-250mm - Epos				
Processing pass:	Sim09I				
Application:	Gauss	v49r22			
System config:	x86_64-slc6-gcc48-opt				
MC TCK:					
Option files:	\$APPCONFIGOPTS/Gauss/pNe-Beam2510GeV-0GeV-md100-2017-PVDZ-500mm.py;\$GAUSSOPTS/BeforeVeloGeometry.py;\$APPC				
Options format:					
Multicore:	No				
Extra packages:	AppConfig.v3r411;Gen/DecFiles.v30r76				
Runtime project:	Select Runtime Project if desired				
CondDB:	sim-20181008-2017pNeBeam2500-vc-md				
DDDB:	dddb-20170721-3				
DQTag:					
Visible:	Yes				
Usable:	Yes				
File types:	Input	Output			
	File type: select file type <input type="button" value="Add"/>	File type: select file type <input type="button" value="Add"/>			
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Solution: LbMCSsubmit

- Write YAML file with minimal information
 - Year, interaction type, ...
- LbMCSsubmit generates a YAML file containing suitable program version numbers, settings, etc.
- **Faster** and **less error-prone**
- **Latest version** of software as default
- Easy to do **bulk edits**

Problems:

- **Only proton-proton collisions supported**
- **Not yet commissioned for wide-spread use**



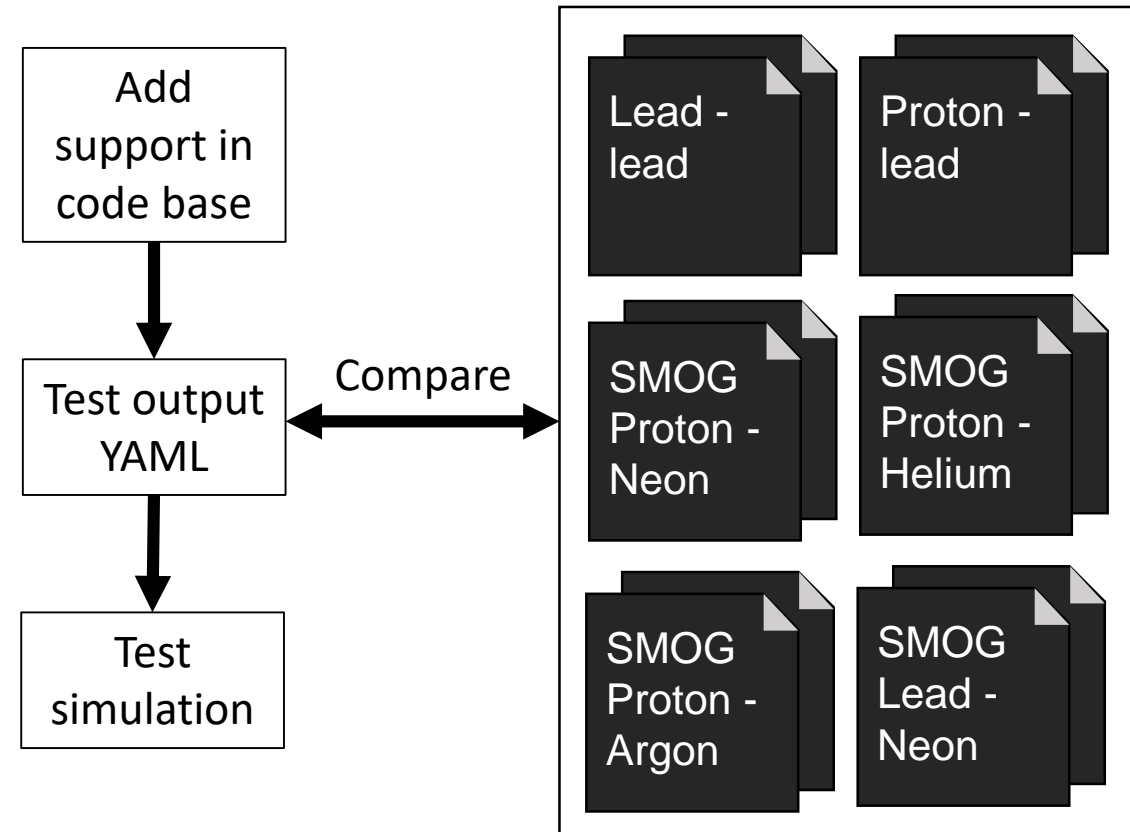
My work: non-pp collision support

Workflow:

- Look at previous requests
- Implement collision type in LbMCSSubmit
- Add unit tests, documentation
- Run sample simulation to test if it works

Outcome:

- Added **support for all collision types** done at LHCb so far
- **Identified errors** in previous production requests
- Submitted production requests for other projects (see presentation by Francis) to stress test LbMCSSubmit

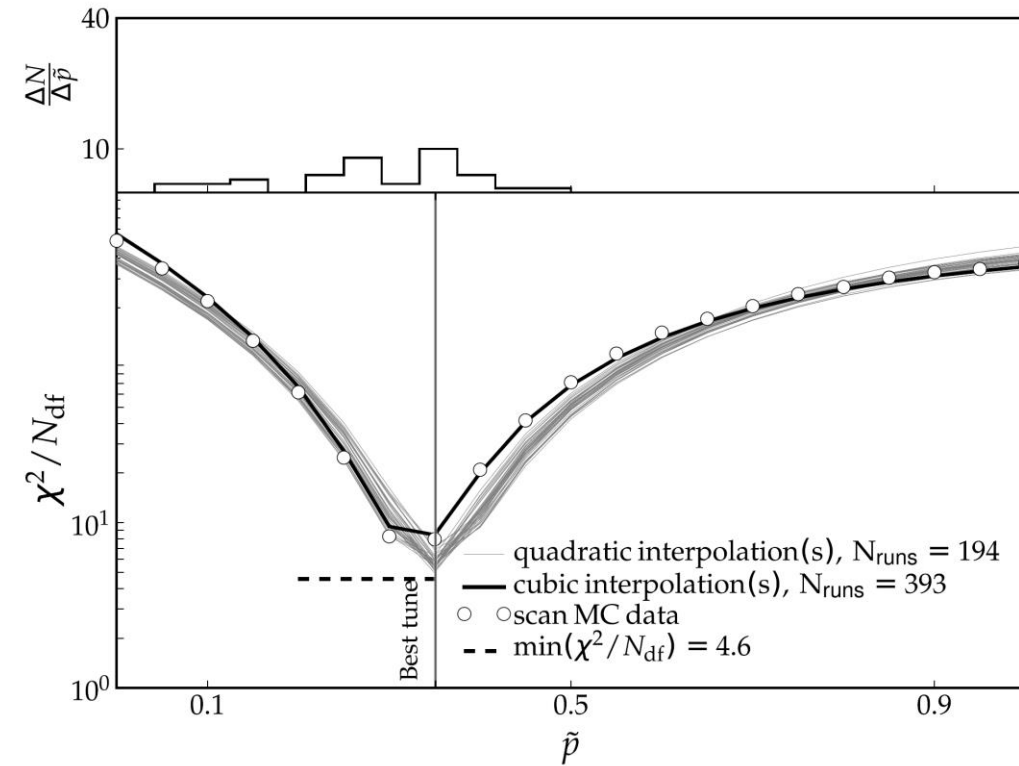


Future work: LbMCSubmit + Professor

- Some parameters in event generators must be tuned to match experimental data
- Optimization/tuning done with [Professor](#)
- Many MC simulations with different parameter values needed

Goal

- Increase simulation speed by simulating on the grid
- Generate simulation production requests needed for Professor using LbMCSubmit



Summary

Background:

- LbMCSSubmit is a program that makes it easier to submit simulation production requests at LHCb

My contributions so far:

- Made it possible to simulate non-pp collisions (PbPb, SMOG, pPb) using LbMCSSubmit
- Resulted in discoveries of previous erroneous production requests
- Tested how well LbMCSSubmit works for real-life use cases

Future work:

- Integrate Professor, used for MC parameter tuning, with LbMCSSubmit