Proposal for atmospheric production

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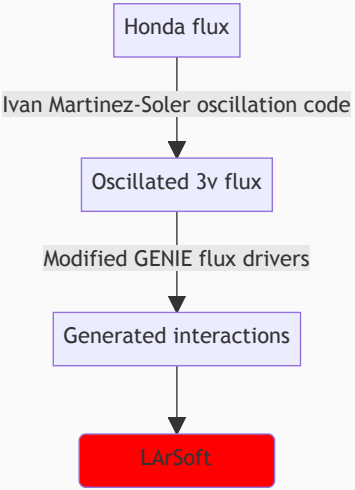
APC - CNRS

Atmospheric production

Previous production



Atmospheric production

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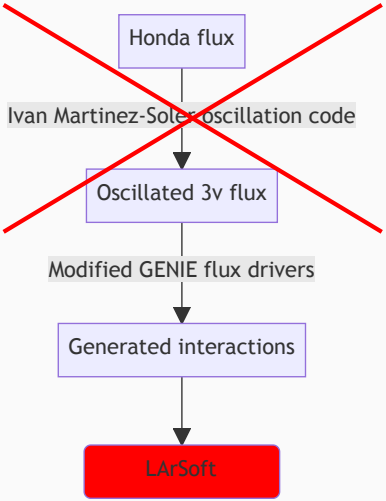

Proposed choices for new production

- Generation according to **generic spectra** (flat angle and $E^{-\text{pow}}$):
  - **Reweighting** according to a specific flux **is made at then end of the analysis**
  - Allows to solve the flux $*$ xsec convolution issue

Atmospheric production

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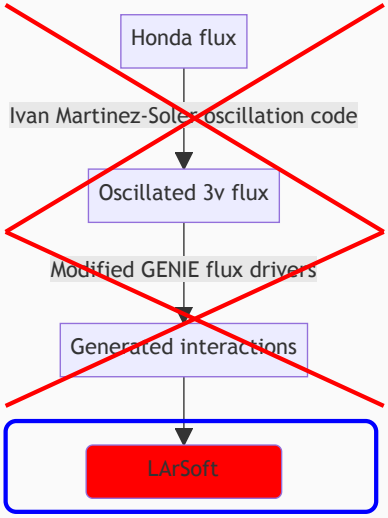

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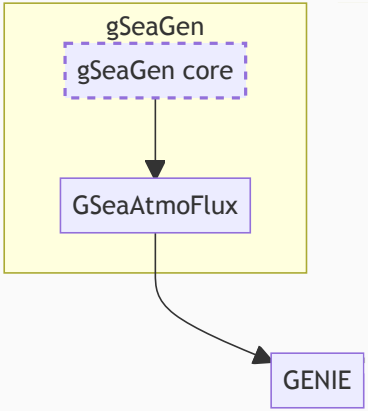
- Integration **witin the LArSoft** analysis pipeline

Atmospheric production



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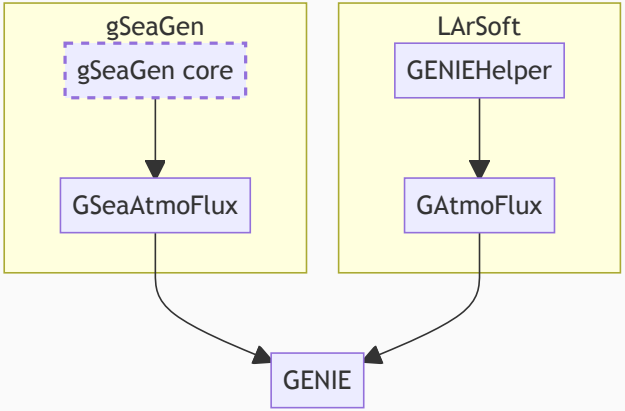
Atmospheric production



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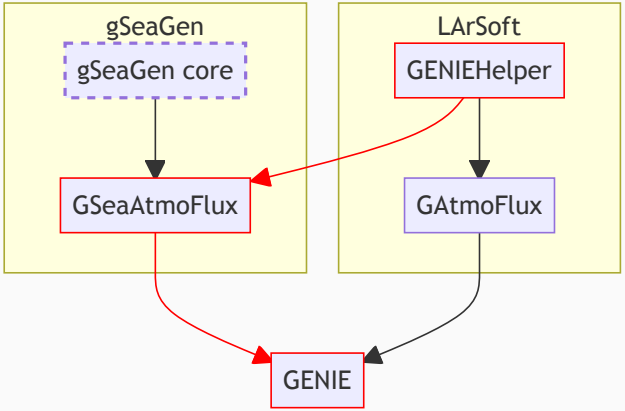
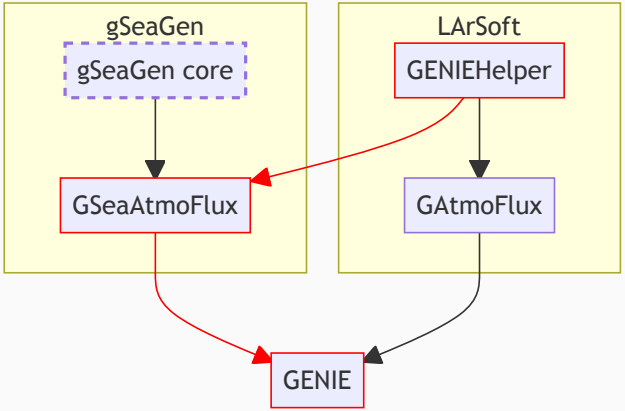
- LArSoft is able to directly call GENIE flux drivers through **GENIEHelper**

Atmospheric production



- gSeaGen is able to produce such flux using a dedicated **GSeaAtmoFlux** flux driver
- LArSoft is able to directly call GENIE flux drivers through **GENIEHelper**
- Proposition to use GSeaAtmoFlux through GENIEHelper from within LArSoft

Atmospheric production



Possible implementation steps

- Ensuring **GSeaAtmoFlux flux driver** can be used for DUNE
- Integrating GSeaAtmoFlux flux driver in LArSoft. **Where explicitly?**
- Adding a wrapper for GSeaAtmoFlux in **GENIEHelper**
- **Adding in the output data** a *neutral weight* (for anyone to reweight) and possibly a weight already computed with a reference flux