GENIE overview	Downloading & Installing GENIE	Inputs	Outputs

Introduction to GENIE

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GENIE overview	Downloading & Installing GENIE	Inputs 00000	Outputs 000
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- Inputs
 - Nuclear Physics Model
 - Cross section Model
 - Neutrino-induced Hadron Production
 - Intranuclear Hadron Transport
 - Realistic Neutrino Flux

4 Outputs

- Neutrino events
- Non-neutrino events
- Output events analyzed

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- GENIE (Generates Events for Neutrino Interaction Experiments) is a ROOT-based Neutrino Monte Carlo Generator
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Neutrino Types	all	all	all
Targets	all	all	all
Energy	${\sim}1~{ m MeV}$	few-GeV	${\sim}100~{ m MeV}$
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Downloading & Installing GENIE

- Download: http://www.hepforge.org/downloads/genie
- GENIE manual: https://arxiv.org/pdf/1510.05494.pdf

Nuclear Physics Model

- The relativistic Fermi gas (RFG) nuclear model is used for all processes and all nuclei (mass density, De Vries1987)
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Neutrino-induced Hadron Production

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- Low invariant mass: AGKY model, generates: hadron shower particle content (p, n, π, K), hadron 4-momenta, hadron system decay

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- GENIE uses subpackage INTRANUKE which simulates rescattering of pions and nucleons in the nucleus

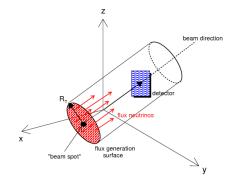
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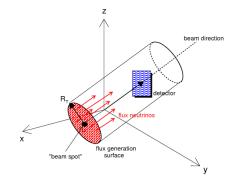
Realistic Neutrino Flux

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- GENIE simulates many neutrino beams used in many realistic, experiment-specific situations: JPARC, NuMI (NINOS, NOvA, MINERvA),



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Non-neutrino events					

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Output events a			