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DUNEPRISM PRE-ND W/S

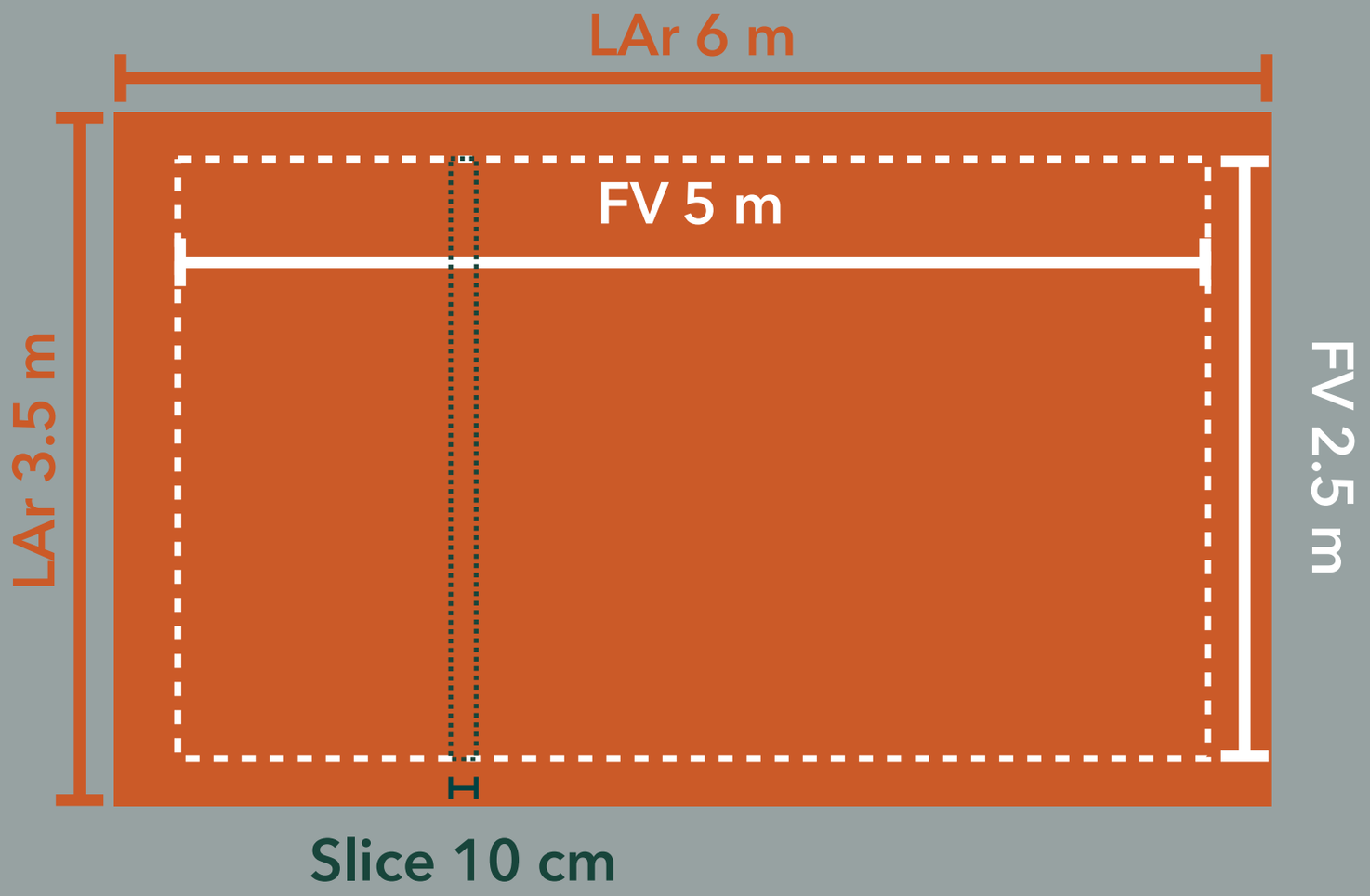
2017-11-03

RUN PLANS AND EVENT RATES UPDATE

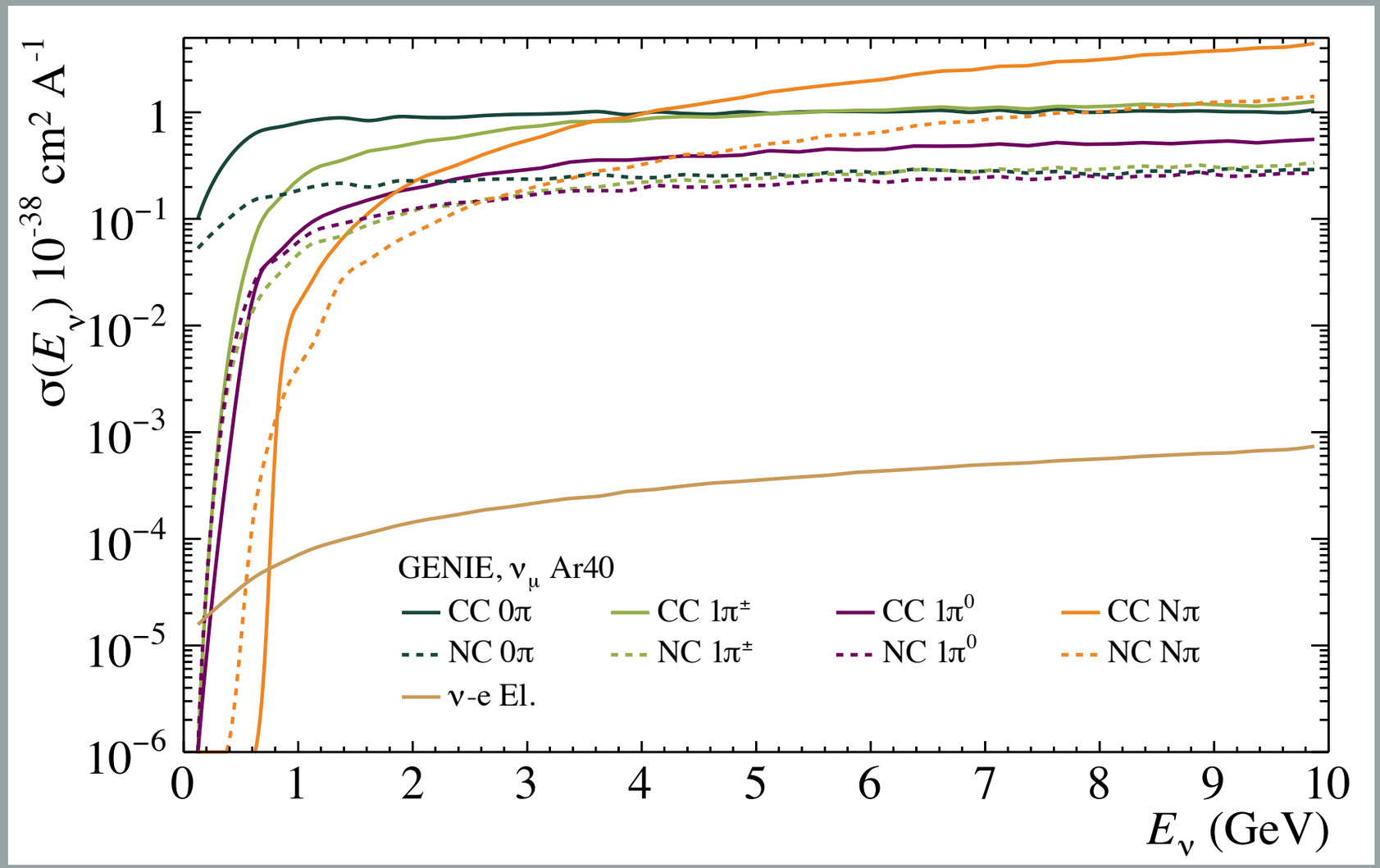
MICHIGAN STATE
UNIVERSITY

EVENT RATE PREDICTIONS

- LAr WLH: 6mx5mx3.5m
- Lose 0.5m each side for FV.
  - Due to Chris' studies, I feel that this may get kick-back, but it is very easy to change.
- Split FV up into 50 x 10 cm slices: 0.1mx4mx3.5m
  - Each: 1,954 kg LAr
- Continuous sampling requires: 0m, 5m, 10m,... 30m



XSECS UPDATE



- Now have nu-e Elastic!
- Still more stats running for the nu-Nucleon, but for tables, it makes little difference.

SOME RUN PLANS...

- Some ‘obvious’ plans that I ran to look at example stats.
- Would be good to have a figure of merit/end goal

```
<DUNEPrism>
  <RunPlan Name="Equal">
    <Detector MeasurementRegionWidth_m="0.1" DetectorFiducialWidth_m="5"
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      <Stop LateralOffset_m="25" POTExposure="0.21E21"/>
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    </Stops>
  </RunPlan>

  <RunPlan Name="HalfOn">
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    <Stops>
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      <Stop LateralOffset_m="5" POTExposure="0.1225E21"/>
      <Stop LateralOffset_m="10" POTExposure="0.1225E21"/>
      <Stop LateralOffset_m="15" POTExposure="0.1225E21"/>
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      <Stop LateralOffset_m="25" POTExposure="0.1225E21"/>
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    </Stops>
  </RunPlan>

  <RunPlan Name="HighFar">
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    DetectorFiducialHeight_m="2.5" DetectorFiducialDepth_m="4"
    FiducialVolumeDensity_kgm3="1396" />
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      <Stop LateralOffset_m="5" POTExposure="0.1E21"/>
      <Stop LateralOffset_m="10" POTExposure="0.1E21"/>
      <Stop LateralOffset_m="15" POTExposure="0.1E21"/>
      <Stop LateralOffset_m="20" POTExposure="0.2E21"/>
      <Stop LateralOffset_m="25" POTExposure="0.2E21"/>
      <Stop LateralOffset_m="30" POTExposure="0.3E21"/>
    </Stops>
  </RunPlan>
</DUNEPrism>
```

EVENT RATES

- Three plans:
  - Equal at each stop

Offset	POT	CC-Total	CC0π	CC1π	CCNπ	$\nu-$e El.
0 m	0.21	1.48e+07	6.18e+06	5.38e+06	3.23e+06	1.21e+03
5 m	0.21	1.13e+07	4.92e+06	3.97e+06	2.44e+06	920
10 m	0.21	5.35e+06	2.76e+06	1.7e+06	8.93e+05	409
15 m	0.21	2.53e+06	1.51e+06	6.8e+05	3.41e+05	184
20 m	0.21	1.39e+06	8.94e+05	3.26e+05	1.69e+05	101
25 m	0.21	8.4e+05	5.67e+05	1.81e+05	9.14e+04	61.6
30 m	0.21	5.44e+05	3.79e+05	1.11e+05	5.31e+04	40.6
All	1.47	3.68e+07	1.72e+07	1.23e+07	7.21e+06	2.93e+03

  - HalfOnAxis

Offset	POT	CC-Total	CC0π	CC1π	CCNπ	$\nu-$e El.
0 m	0.735	5.17e+07	2.16e+07	1.88e+07	1.13e+07	4.25e+03
5 m	0.122	6.61e+06	2.87e+06	2.32e+06	1.42e+06	537
10 m	0.122	3.12e+06	1.61e+06	9.89e+05	5.21e+05	238
15 m	0.122	1.47e+06	8.79e+05	3.97e+05	1.99e+05	107
20 m	0.122	8.1e+05	5.21e+05	1.9e+05	9.83e+04	58.7
25 m	0.122	4.9e+05	3.31e+05	1.06e+05	5.33e+04	35.9
30 m	0.122	3.17e+05	2.21e+05	6.5e+04	3.1e+04	23.7
All	1.47	6.45e+07	2.8e+07	2.29e+07	1.36e+07	5.25e+03

  - HalfOnMoreFar

Offset	POT	CC-Total	CC0π	CC1π	CCNπ	$\nu-$e El.
0 m	0.47	3.31e+07	1.38e+07	1.2e+07	7.22e+06	2.71e+03
5 m	0.1	5.39e+06	2.34e+06	1.89e+06	1.16e+06	438
10 m	0.1	2.55e+06	1.31e+06	8.07e+05	4.25e+05	195
15 m	0.1	1.2e+06	7.17e+05	3.24e+05	1.62e+05	87.7
20 m	0.2	1.32e+06	8.51e+05	3.1e+05	1.6e+05	95.9
25 m	0.2	8e+05	5.4e+05	1.72e+05	8.71e+04	58.7
30 m	0.3	7.77e+05	5.42e+05	1.59e+05	7.59e+04	58
All	1.47	4.51e+07	2.01e+07	1.57e+07	9.29e+06	3.65e+03

WE APOLOGISE FOR ANY INCONVENIENCE

THANK YOU

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