

MILO VERMEULEN — 30-7-2020

EIGENNEUT PLOTS

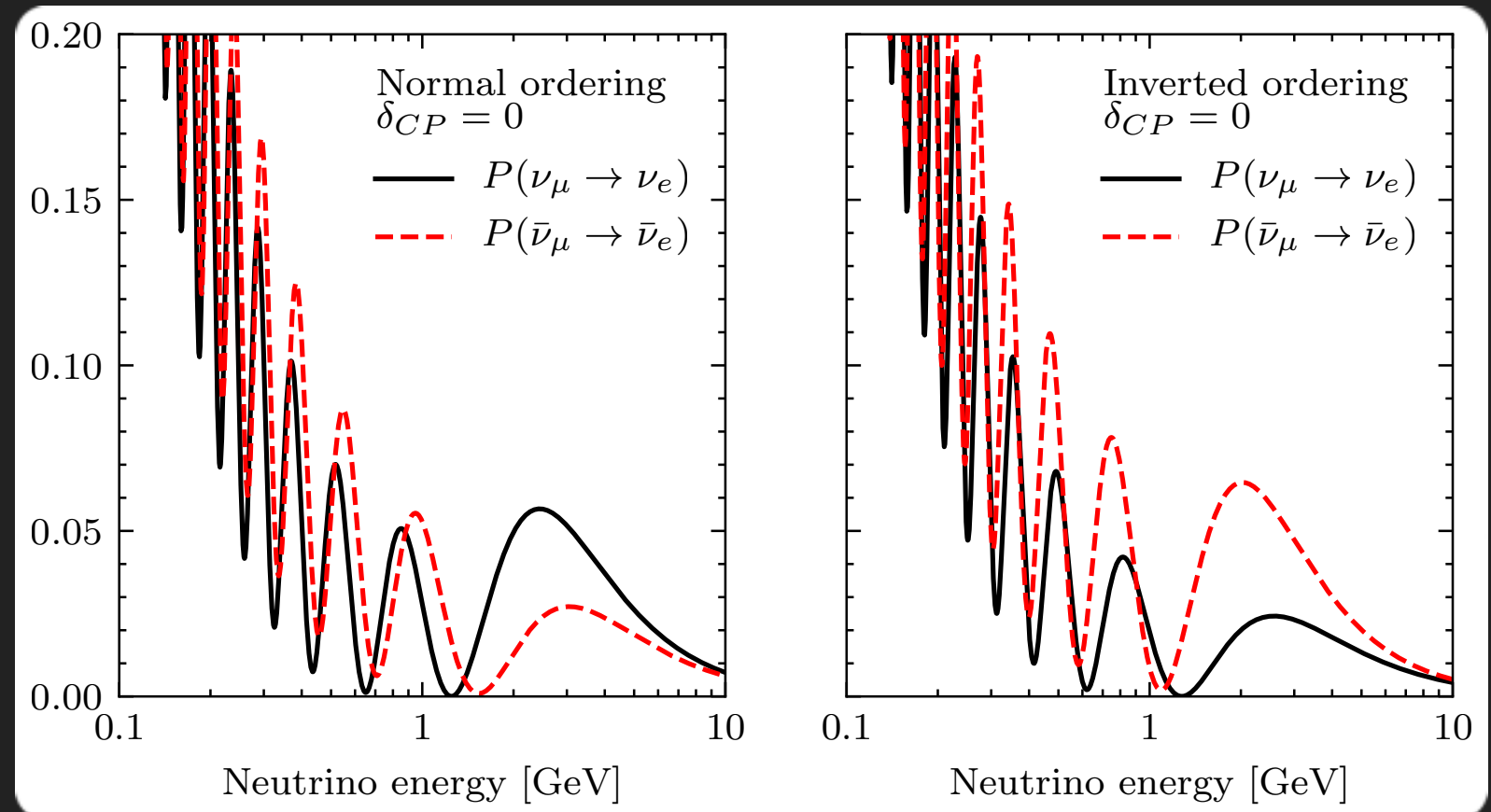
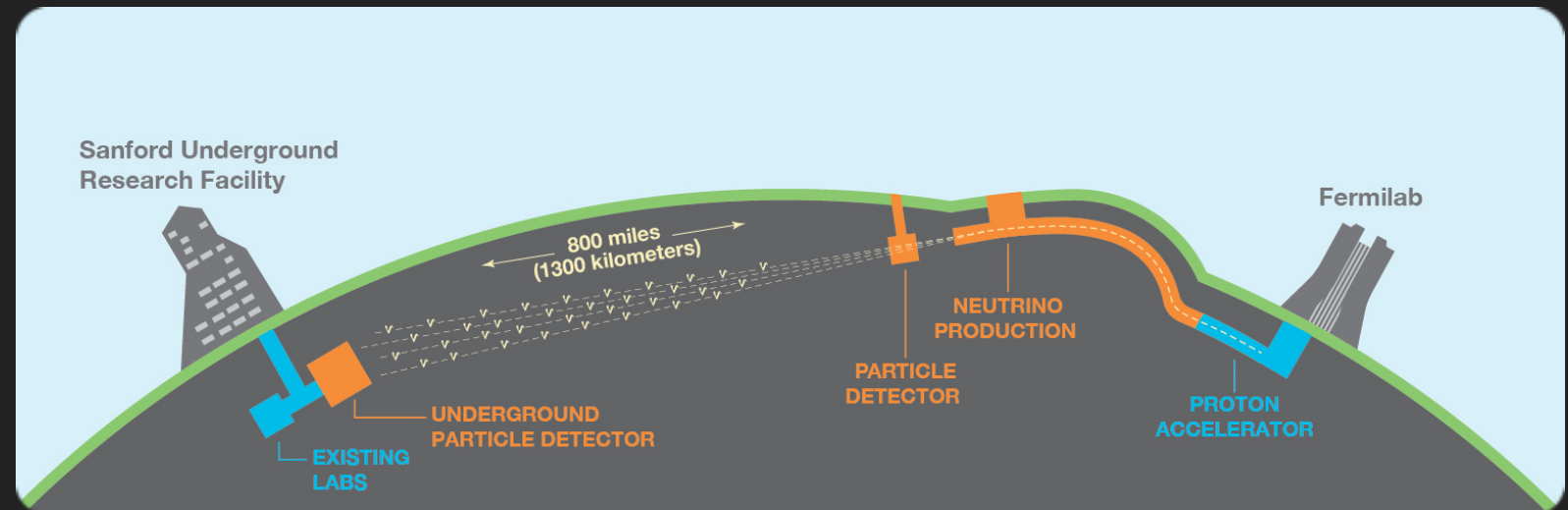
FINAL UPDATES

- ▶ Make program run with (old) Ubuntu SFML versions
 - ▶ Thanks to Bouke and Lodewijk for help with debugging!
- ▶ Save parameters to file when exporting data
- ▶ Use time-costly exponential function when exporting oscillation data instead of Lie product formula approximation

| Parameter | Value |
|-------------------------------------|-----------|
| Initial flavour | 1 |
| Antineutrino [bool] | 1 |
| Energy [GeV] | 0.9 |
| Travel distance [km] | 1284.9 |
| theta12 [rad] | 0.5843 |
| theta23 [rad] | 0.738 |
| theta13 [rad] | 0.148 |
| Dm21sq [eV ²] | 7.5e-05 |
| Dm31sq [eV ²] | -0.002457 |
| dCP [rad] | 6.28319 |
| Matter density [kg/m ³] | 2848.2 |

EXAMPLE PLOTS

- ▶ DUNE baseline
~1300 km
- ▶ Neutrino energy
~0.5–5 GeV
- ▶ Most important measurements:
 - ▶ Mass hierarchy
 - ▶ Value δ_{CP}

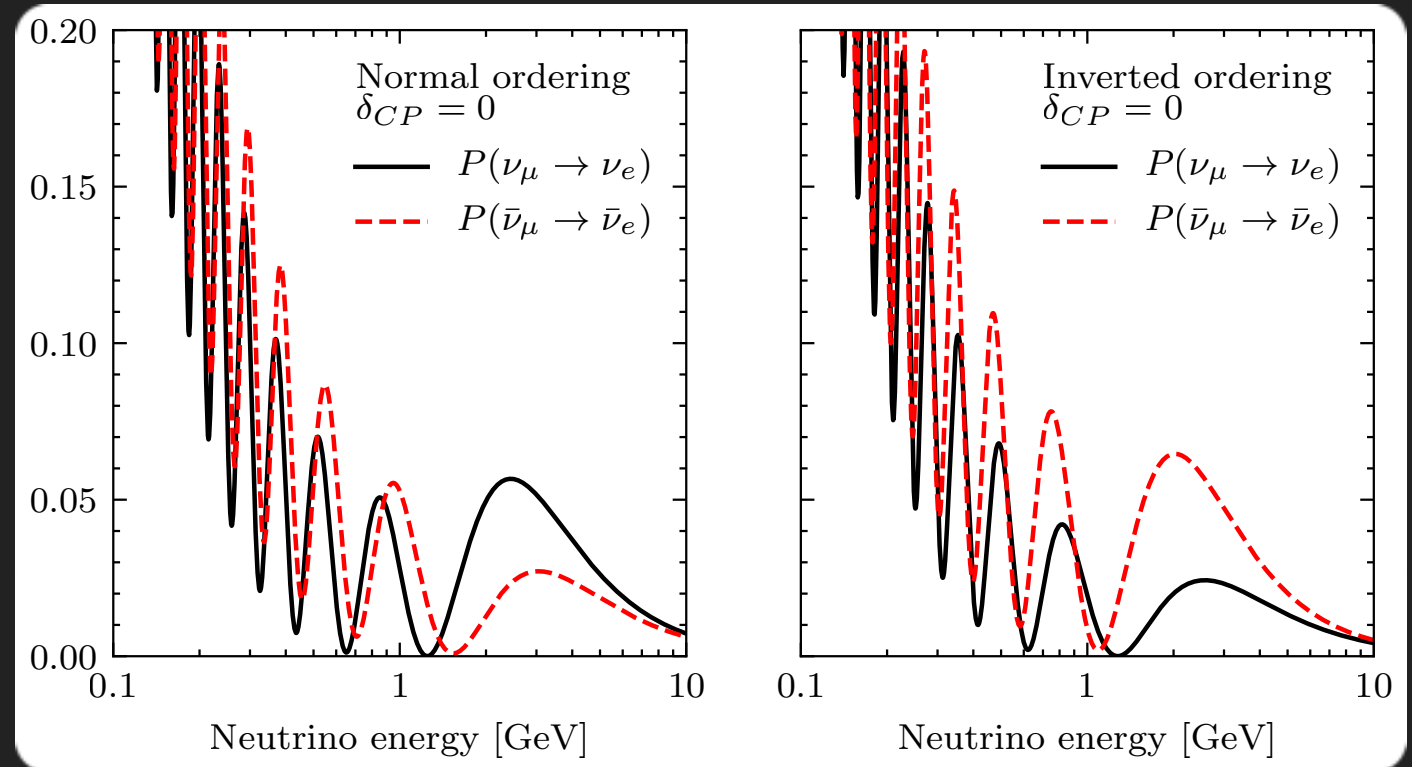


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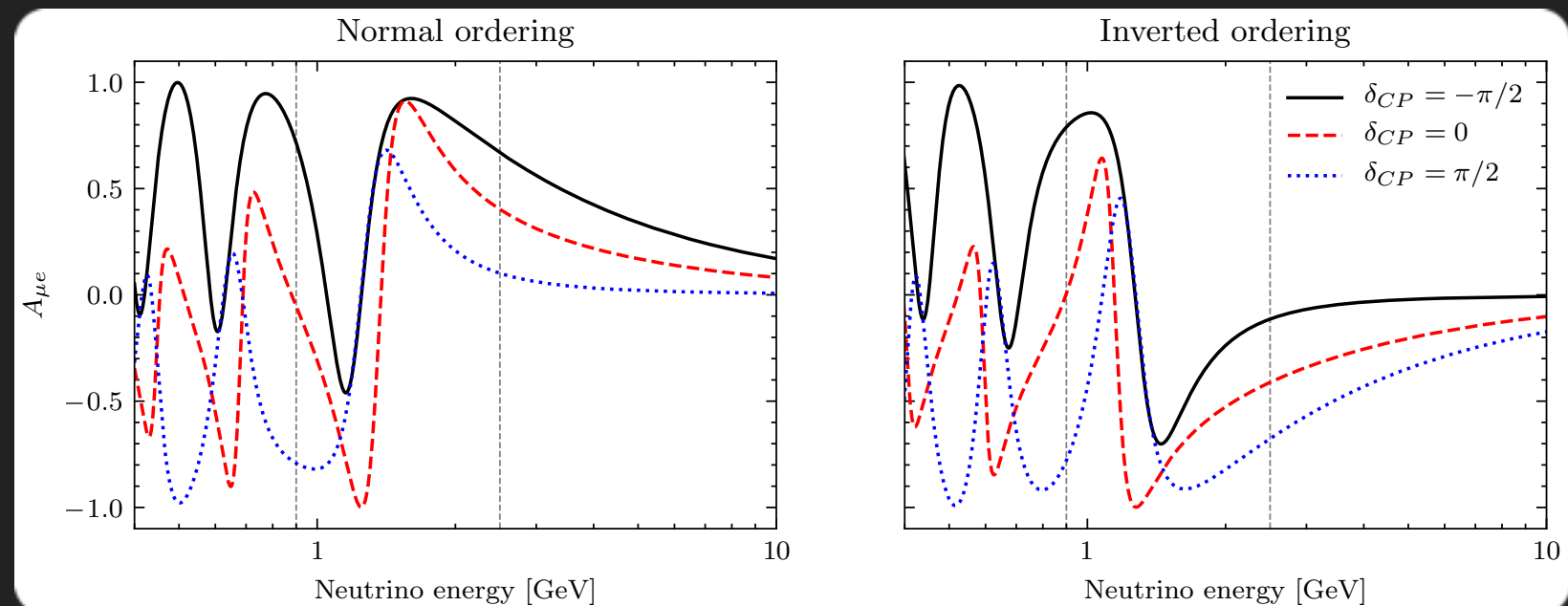
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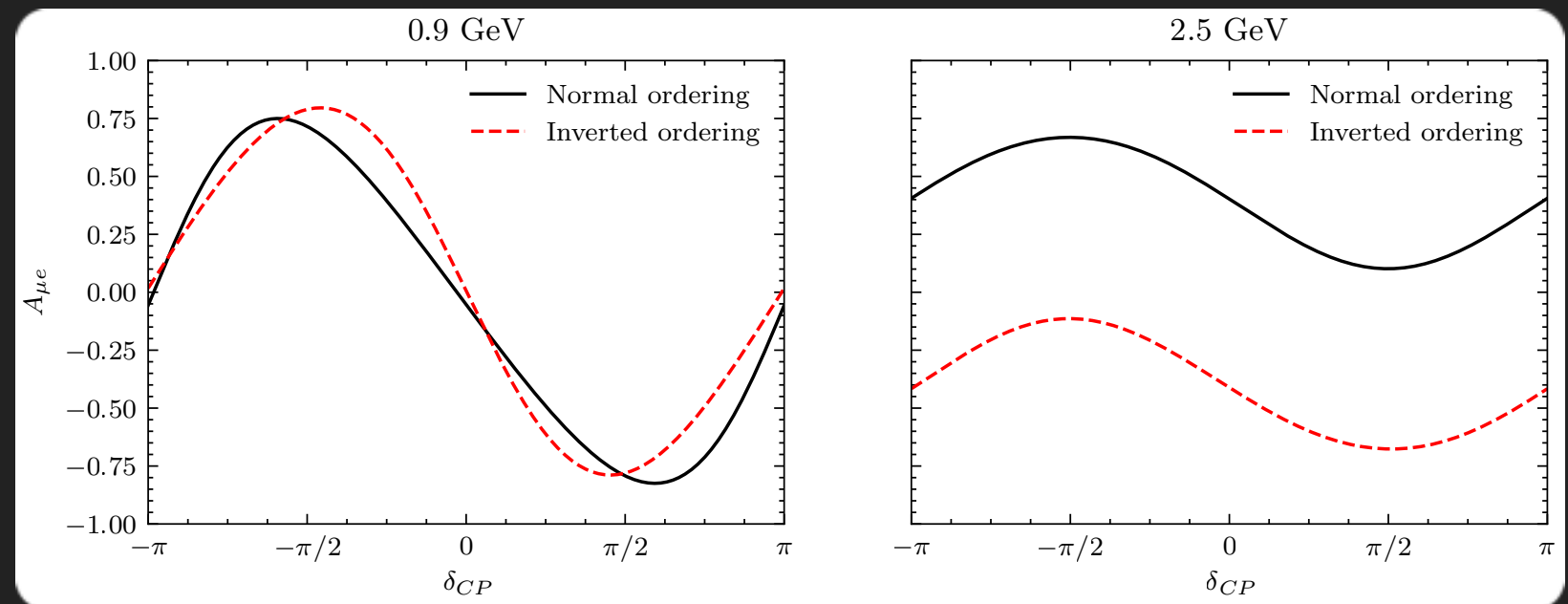
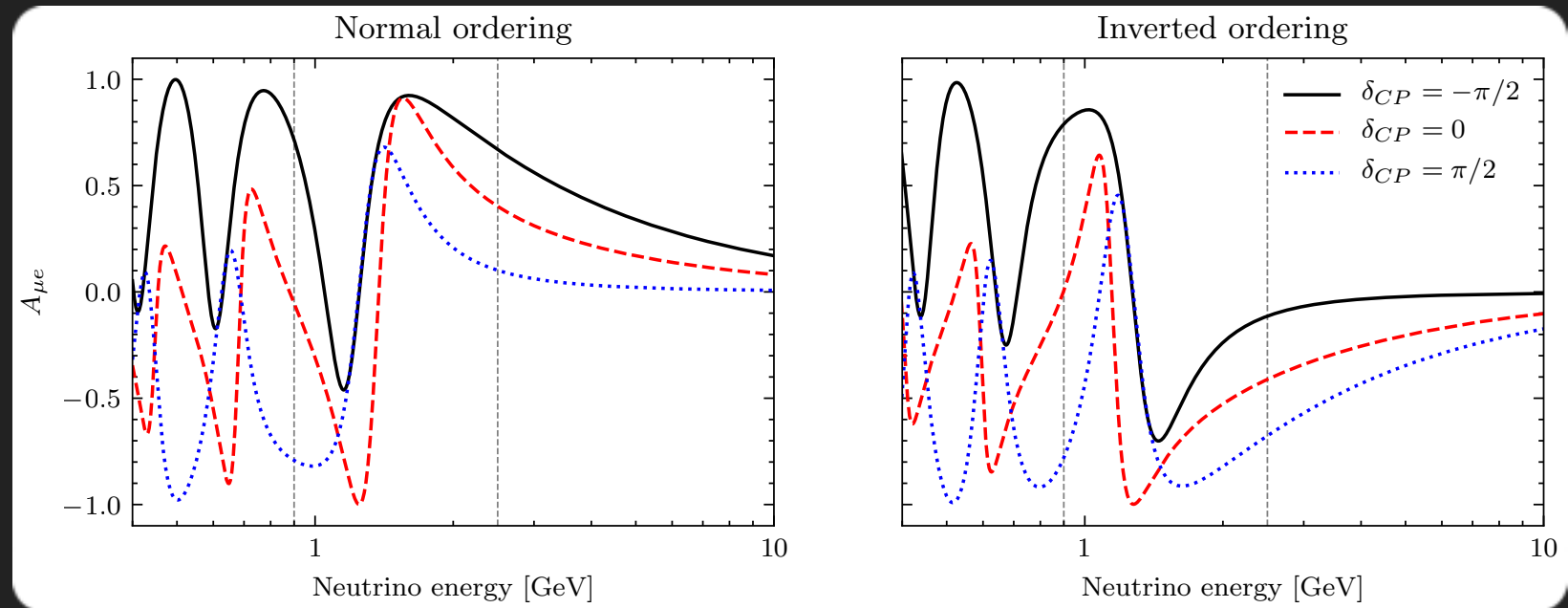


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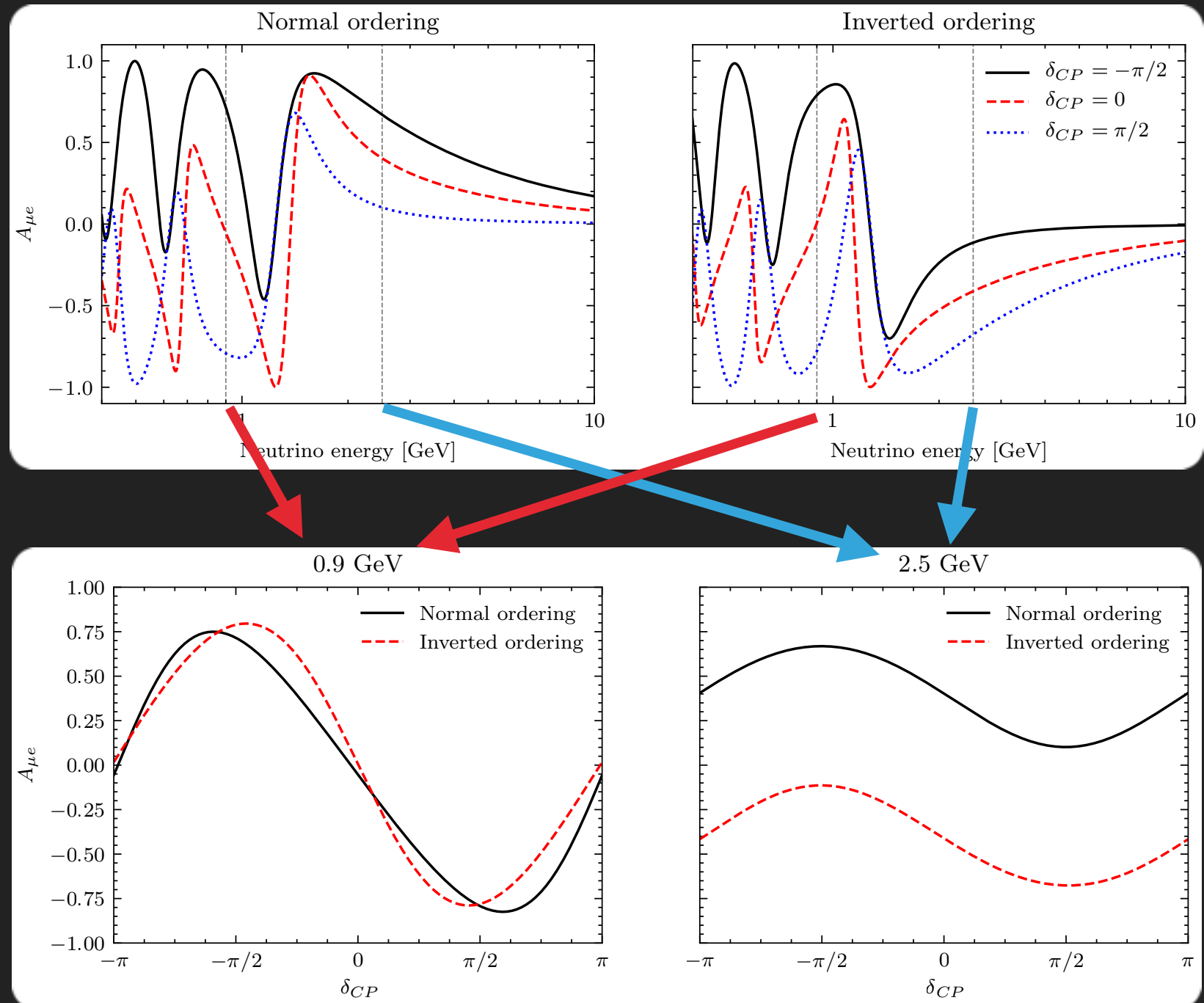
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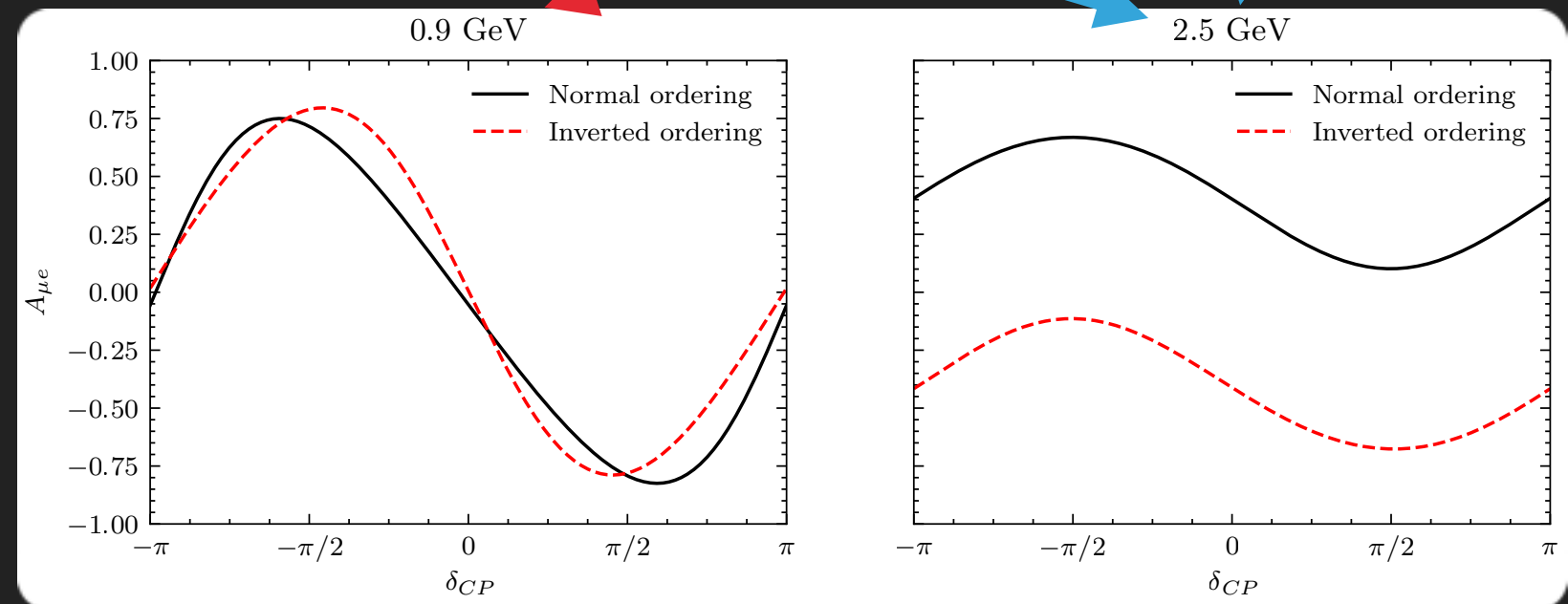
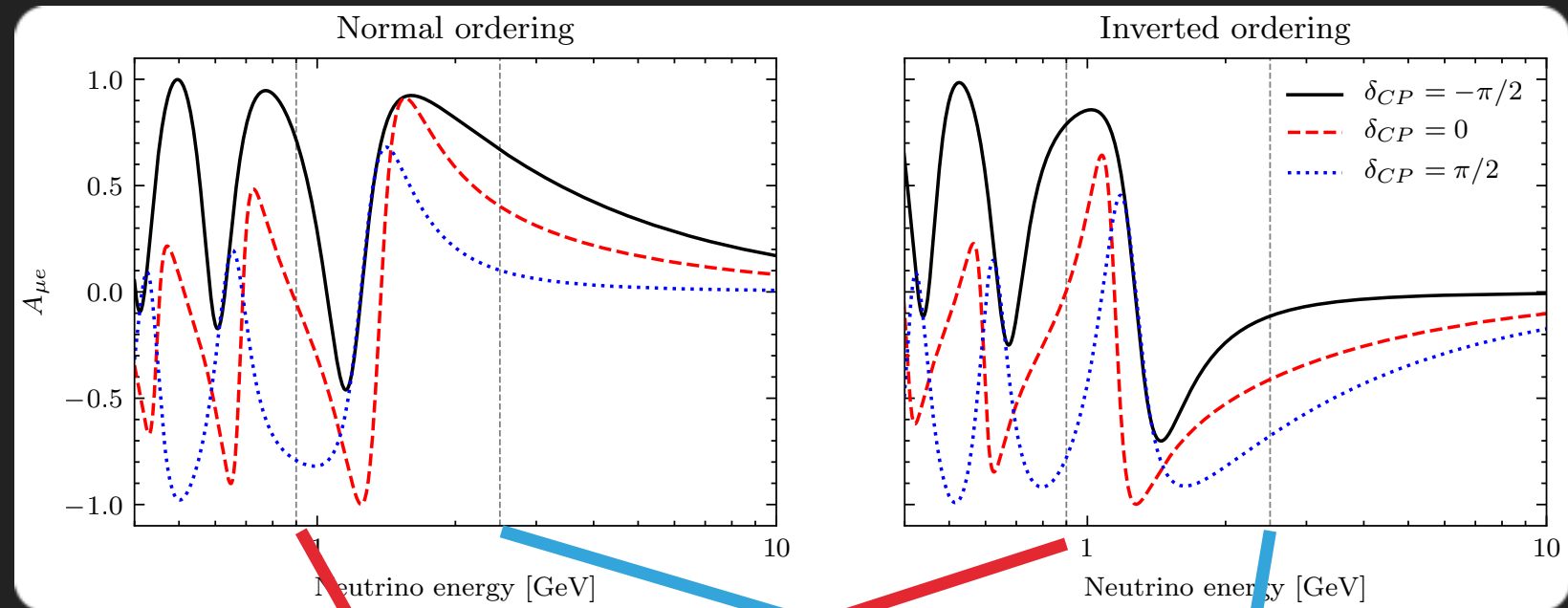
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Measure δ_{CP} regardless of ordering

Measure ordering regardless of δ_{CP}

POSSIBLE NEXT STEPS

- ▶ Convert to Javascript and put online as a web-app
- ▶ Make back-end for Python module (suggested by Lodewijk)
- ▶ Probably not going to work much more on this in light of thesis

BASIC INFORMATION

- ▶ Program written in C++, built using CMake
- ▶ Dependencies: SFML 2 for drawing, Eigen 3 for matrix operations

- ▶ Check it out on GitHub: <https://github.com/MiVermeu/EigenNeut>

