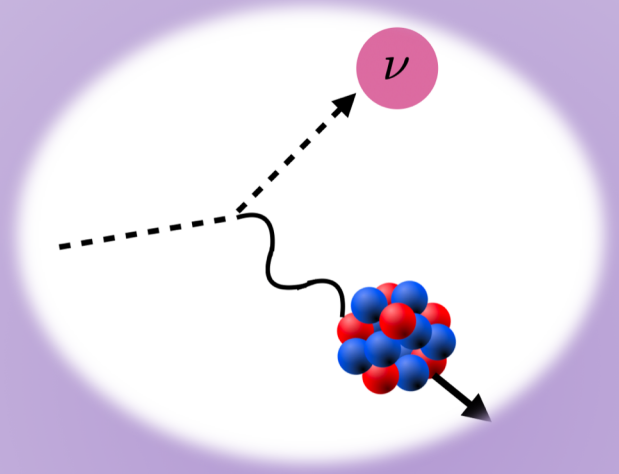
Scrutinizing the CEvNS analysis



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Paper to appear soon

1. Coherent elastic neutrino nucleus scattering

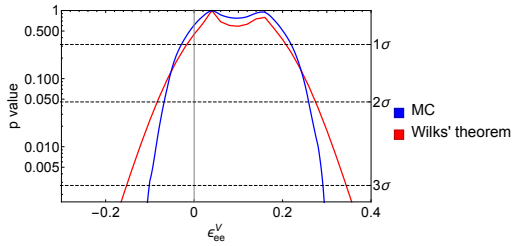
- First observed by the COHERENT collaboration in 2017 with CsI detector
- Large interest to use the data to constrain standard and beyond standard physics
- Correct statistical treatment of data crucial to derive correct conclusions

Here: analyze publicly available CsI data

→ **Establish correct analysis procedure**

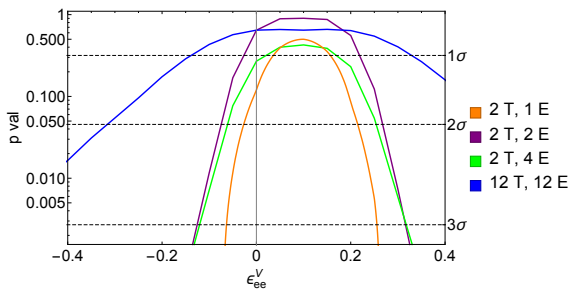
2. Statistical treatment

- Small number of events per bin: Wilks' theorem is not fulfilled
- MC calculation of p value necessary



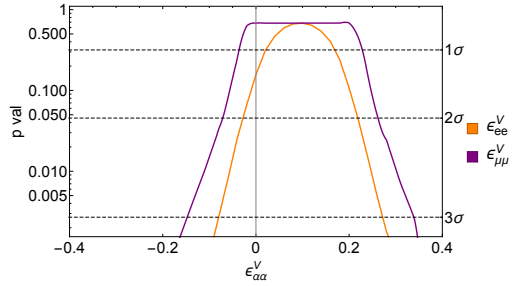
3. Ideal number of bins

- More bins ≠ more information
- Ideal number of bins depends on model to test
- 2 timing, 1 energy bin ideal to test all NSI simultaneously
- 1 bin ideal for only one non-zero NSI parameter



4. Results

vectorial NSI: consider all NSI parameters to be non-zero simultaneously



5. Conclusion

- Established analysis framework to analyze current and future CEvNS data
- Release open source code to enable easy implementation of other new physics scenarios

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