

## Probing the Solar Neutrino Day/Night Effect

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Hints of neutrino oscillations were first apparent in the solar electron neutrino deficit observed by the Davis Solar Neutrino experiment in the Homestake Mine (Lead, SD). Subsequent experiments showed that neutrinos oscillate - proving they are massive. This, paired with the Mikheyev-Smirnov-Wolfenstein (MSW) effect explaining how matter alters oscillations, allows for a full explanation of the observed solar electron neutrino flux.

The MSW effect depends on electron density, so it is present in the Sun as well as the Earth. Super-Kamiokande has shown this results in a measurable non zero difference between nighttime and daytime flux. This asymmetry is the Solar Neutrino Day/Night Effect. We are doing an analysis of this using a simplified model which estimates the asymmetry at different times of night. Initially, we have done so using energy scaling appropriate for experiments with existing data (e.g. Super-Kamiokande). By then changing the energy scaling, we see how visible this asymmetry will be to DUNE. Additionally, we are considering how further enhancements to DUNE, such as a low backgrounds module, may aid in probing this effect.

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