

Daya Bay final results with open data and model

Vitalii Zavadskyi
on behalf of the Daya Bay Collaboration

Joint Institute for Nuclear Research
QUARKS-2026

18 May 2026



1 Introduction

- Why open dataset/model

2 Daya Bay Reactor Neutrino Experiment

- Oscillations, etc.
- Experimental setup
- 3ν results and flux measurements

3 Dataset: complete and light versions

- Overview
- Examples of reproducing the Daya Bay results with light dataset
- Features of the complete dataset

4 Summary

Introduction

Why open dataset/model

- Publications usually do not provide a full description of model and obtained results
 - Often, we digitize observations from plots
 - Sometimes we have access to official „ χ^2 -maps“, „observed spectrum“, etc.
- If we want to do high precision measurements, we may need
 - > Access to the data of other experiments
 - > A way to construct an observation and statistic with their data

- Publications usually do not provide a full description of model and obtained results
 - Often, we digitize observations from plots
 - Sometimes we have access to official „ χ^2 -maps“, „observed spectrum“, etc.
- If we want to do high precision measurements, we may need
 - > Access to the data of other experiments
 - > A way to construct an observation and statistic with their data
 - In most cases, we use external constraints as a pull term
 - Correlated systematics can not be propagated in a proper way

- Publications usually do not provide a full description of model and obtained results
 - Often, we digitize observations from plots
 - Sometimes we have access to official „ χ^2 -maps“, „observed spectrum“, etc.
- If we want to do high precision measurements, we may need
 - > Access to the data of other experiments
 - > A way to construct an observation and statistic with their data
 - In most cases, we use external constraints as a pull term
 - Correlated systematics can not be propagated in a proper way
- Open dataset and model can solve issues above

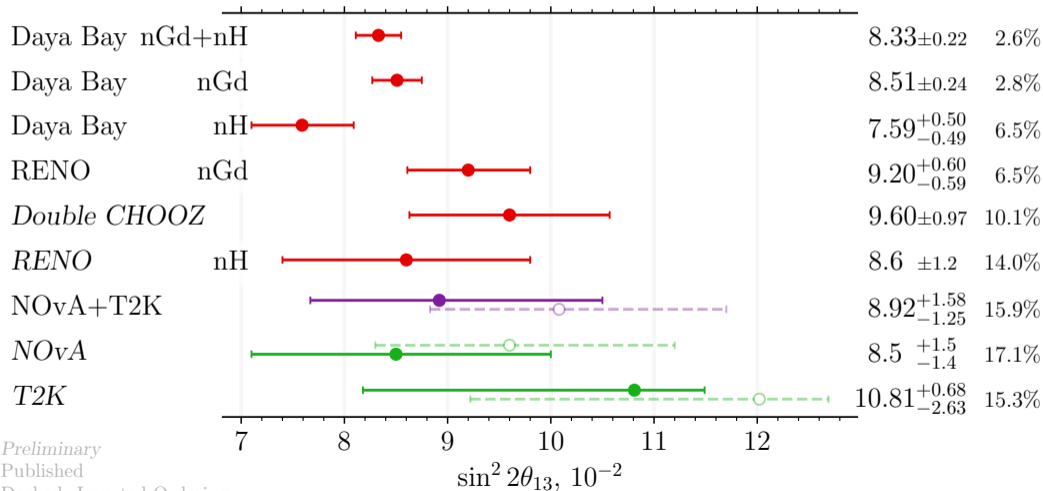
Introduction

Why open dataset/model

- Publications usually do not provide a full description of model and obtained results
 - Often, we digitize observations from plots
 - Sometimes we have access to official „ χ^2 -maps“, „observed spectrum“, etc.
- If we want to do high precision measurements, we may need
 - > Access to the data of other experiments
 - > A way to construct an observation and statistic with their data
 - In most cases, we use external constraints as a pull term
 - Correlated systematics can not be propagated in a proper way
- Open dataset and model can solve issues above
 - + Full model allows to obtain precise results
 - + Correlated systematics will be propagated correctly
 - Implementation should have an adapter to call external models
 - Prelaration of open data and model might take a lot of time

Introduction

Why open dataset/model



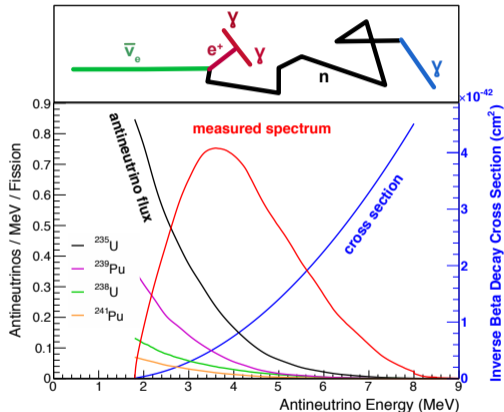
Preliminary
Published

Dashed: Inverted Ordering

Daya Bay Reactor Neutrino Experiment

Oscillations, etc.

- Neutrino flavor oscillates with distance
 $(\nu_{e,\mu,\tau} \rightarrow \nu_{e,\mu,\tau})$
- Oscillation can be studied with accelerators, nuclear reactors, astrophysical sources, etc.
- Nuclear reactors are the most intense artificial source of (anti)neutrinos ($10^{20} \bar{\nu}_e/\text{sec/GWt}$)
- Energies of $\bar{\nu}_e$ is mostly below 10 MeV, it allows to measure survival probability of $\bar{\nu}_e$



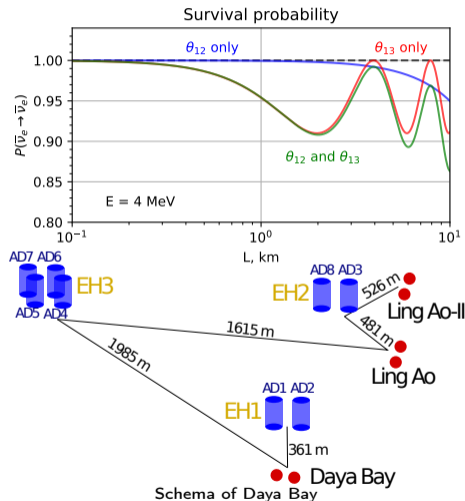
Daya Bay Reactor Neutrino Experiment

Experimental setup

- Experiment was taking data from December 2011 to December 2020
- One of the main goals is precision measurement of $\sin^2 2\theta_{13}$ and Δm_{32}^2
- Search for sterile neutrinos, high energy reactor antineutrinos ($E_\nu > 10$ MeV), measurement of ^{235}U and ^{239}Pu spectra

$$P(\bar{\nu}_e \rightarrow \bar{\nu}_e) \approx 1 - \cos^4 \theta_{13} \sin^2 2\theta_{12} \left(\frac{\Delta m_{21}^2 L}{4E} \right) - \sin^2 2\theta_{13} \sin^2 \left(\frac{\Delta m_{ee}^2 L}{4E} \right)$$

$$\Delta m_{ee}^2 = \cos^2 \theta_{12} \Delta m_{31}^2 + \sin^2 \theta_{12} \Delta m_{32}^2$$

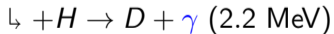
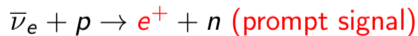


Daya Bay Reactor Neutrino Experiment

Experimental setup

- Experiment was taking data from December 2011 to December 2020
- One of the main goals is precision measurement of $\sin^2 2\theta_{13}$ and Δm_{32}^2
- Search for sterile neutrinos, high energy reactor antineutrinos ($E_\nu > 10$ MeV), measurement of ^{235}U and ^{239}Pu spectra

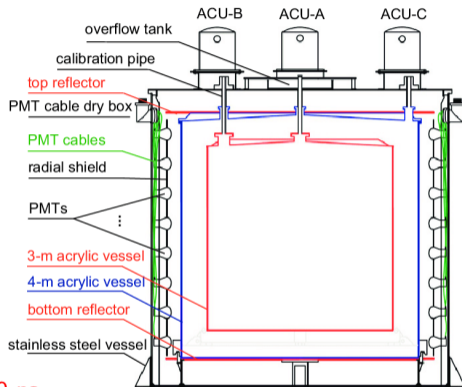
IBD – inverse β -decay



$$\tau \simeq 80 \text{ ns}$$

$$\tau \simeq 200 \mu\text{s}$$

$$\tau \simeq 30 \mu\text{s}$$

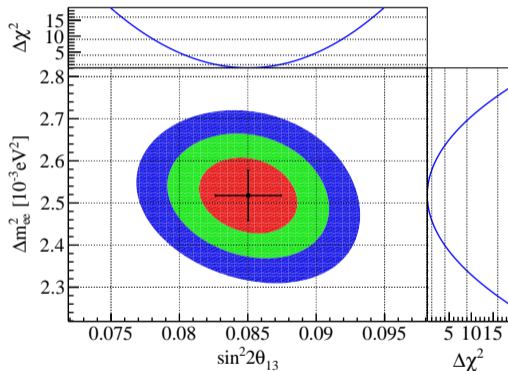
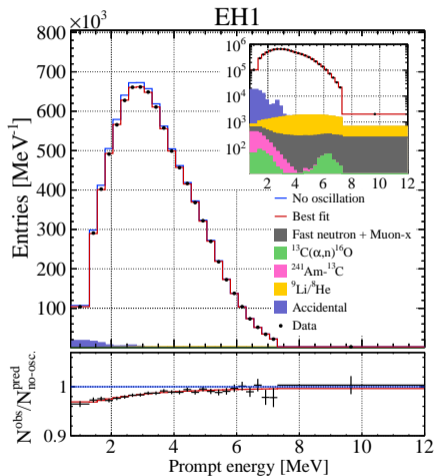


Schema of antineutrino detector (AD)

$$\sigma_E/E = 8.66\%/\sqrt{E} \text{ [MeV]}$$

Daya Bay Reactor Neutrino Experiment

3ν results and flux measurements

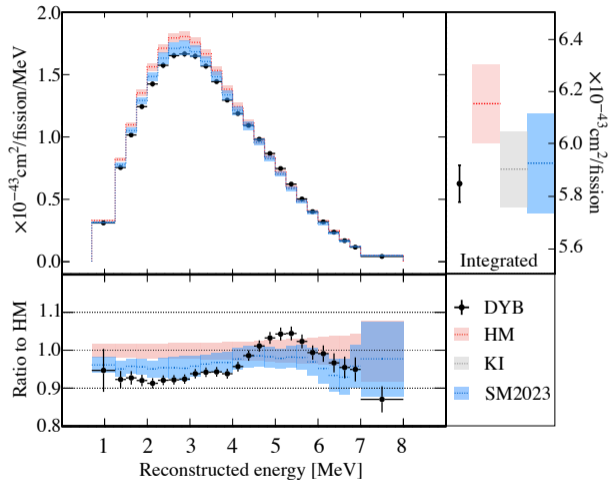


PRL 130, 161802 (2023)

Blue links are clickable

Daya Bay Reactor Neutrino Experiment

3ν results and flux measurements



[PRL 134, 201802 \(2025\)](#)

Blue links are clickable

Dataset: complete and light versions

Overview

Three periods of data taking (final-state neutron captured on gadolinium)

- 3 near + 3 far detectors: 0 – 210 days
 - 4 near + 4 far detectors: 300 – 1820 days
 - 3 near + 4 far detectors: 1850 – 3280 days
- 3158 days of operation

	Hall 1	Hall 2	Hall 3
Number of detectors	2	2	4
IBD candidates	2 236 810	2 544 894	764 414
ν_e rate [day^{-1}]	1342.29	1191.18	300.57
Background rate [day^{-1}]	21.93	16.20	4.47
Background / Signal ratio, %	1.63	1.36	1.58

- **Zenodo dataset** (full+light): zenodo.org/records/17587229

Dataset: complete and light versions

Overview

The screenshot shows the Zenodo record page for the dataset. At the top, the Zenodo logo and navigation links are visible. The dataset title is 'Full Data Release of the Daya Bay Reactor Neutrino Experiment', published on November 15, 2025, in version 1.0.0. It has 489 views and 496 downloads. The 'Versions' section shows the current version, 1.0.0, with a DOI of 10.5281/zenodo.17587229. The 'External resources' section includes a link to OpenAIRE. The 'Citation statement' provides the citation for the dataset. The 'Keywords and subjects' section lists terms like 'reactor electron antineutrino', 'inverse beta decay', 'neutrino oscillation', 'neutrino', and 'neutrino mixing'. The 'Contributors' section lists the contact person and data manager. The 'Summary' section provides a detailed description of the dataset and its significance.

zenodo.org/records/17587229

zenodo

Search records... [Log in] [Sign up]

Communities My dashboard

Daya Bay

Published November 15, 2025 | Version 1.0.0

Dataset Open

489 VIEWS 496 DOWNLOADS

Show more details

Versions

Version 1.0.0 Nov 15, 2025

10.5281/zenodo.17587229

Cite all versions? You can cite all versions by using the DOI 10.5281/zenodo.17587228. This DOI represents all versions, and will always resolve to the latest one. Read more.

External resources

Indexed in

OpenAIRE

Communities

Daya Bay

Keywords and subjects

reactor electron antineutrino inverse beta decay

neutrino oscillation neutrino neutrino mixing

Contributors

Contact person (2): Yu, Zeyuan¹ Gonchar, Maxim²

Data manager: Zavadskyi, Vitalii²

Show affiliations

Full Data Release of the Daya Bay Reactor Neutrino Experiment

Daya Bay Collaboration

Full Data Release of the Daya Bay Reactor Neutrino Experiment

Summary

The repository contains the full Daya Bay data set of inverse-beta-decay (IBD) candidates (reactor electron antineutrino interactions) with the final-state neutron captured on gadolinium. The dataset and supplementary data are sufficient to reproduce the measurement of neutrino oscillation parameters $\sin^2\theta_{13}$ and Δm_{21}^2 , published in *Phys. Rev. Lett.* 130 (2023) 16, 161802.

The Daya Bay Reactor Neutrino Experiment took data from 2011 to 2020 in China. It obtained a sample of 5.55 million IBD events with the final-state neutron captured on gadolinium (nGd). This sample was collected by eight identically designed antineutrino detectors (AD) observing antineutrino flux from six nuclear power plants located at baselines between 400 m and 2 km. It covers 3158 days of operation.

Code is provided elsewhere to read the dataset and produce a measurement of $\sin^2\theta_{13}$ and Δm_{21}^2 , consistent with the publication.

Citation statement

If you use the dataset, cite the following sources:

[1] Daya Bay Collaboration, "Full Data Release of the Daya Bay Reactor Neutrino Experiment", v1.0.0. Zenodo, DOI:10.5281/zenodo.17587229, 2025.

[2] F. P. An et al. (Daya Bay collaboration), "Precision Measurement of Reactor Antineutrino Oscillation at Kilometer-Scale Baselines by Daya Bay", *Phys. Rev. Lett.* 130,161802 (2023), DOI: 10.1103/PhysRevLett.130.161802.

The dataset organization

Zenodo dataset: zenodo.org/records/17587229

Blue links are clickable

Vitalii Zavadskyi (zavadskyi@jinr.ru)

Daya Bay final results with open data and model

26/05/18

7.2 / 12

Dataset: complete and light versions

Overview



Published November 15, 2018 | Version 1.0.0

Full Data Release of the Day

Days Bay Collaboration

Contributors

Contact person (2): "Yu, Ziqian" "Scherer, Martin"

Data manager: "Zavatskyi, Vitalii"

Full Data Release of the Day

Summary

The repository contains the full Days Bay data set of insect gaitform. The dataset and supplementary data are with DOI: 10.5281/zenodo.17587229.

The Days Bay Reactor Neutrons Experiment took data for gadolinium (Gd). This sample was collected by eight 10m baselines between 480 m and 2 km. It covers 3158 days. Code is provided elsewhere to read the dataset and plot.

Citation statement

If you use the dataset, cite the following sources:

[1] Days Bay Collaboration, "Full Data Release of the Day"

[2] P. P. An et al. (Days Bay collaboration), "Precision Meas- urement of the Neutron Lifetime," *Physical Review Letters* 120:101801 (2018), DOI: 10.1103/PhysRevLett.120.101801

The dataset organization

Files

dayabay_full_dataset_hdf5_1-0-0.zip

Files (821.0 MB)

Name	Size	Download all
dayabay_analysis_dataset_hdf5_1-0-0.zip md5:e5c8bac4256021f562464602d0c090c	1.3 MB	Preview Download
dayabay_analysis_dataset_npz_1-0-0.zip md5:d1c33dce75508b53e9821329b3e06a17	1.4 MB	Preview Download
dayabay_analysis_dataset_root_1-0-0.zip md5:9030d084c156ef0bb213749eba4012a	1.3 MB	Preview Download
dayabay_analysis_dataset_tsv_1-0-0.zip md5:7e59a5190d4cb4a751b374567b5a415	1.5 MB	Preview Download
dayabay_full_dataset_hdf5_1-0-0.zip md5:17e031e85b4688d0e83117c2781b1e1	203.0 MB	Preview Download
dayabay_full_dataset_npz_1-0-0.zip md5:d6a1facbc399e8f3c7921b80eeb53c8	203.4 MB	Preview Download
dayabay_full_dataset_root_1-0-0.zip md5:d24695d30e0e06235c78e97986367b05	189.0 MB	Preview Download
dayabay_full_dataset_tsv_1-0-0.zip md5:0a82ea82156041cc9cdc34410ed844d6	220.1 MB	Preview Download

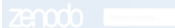
Zenodo dataset: zenodo.org/records/17587229

Blue links are clickable

Dataset: complete and light versions

Overview

zenodo.org/records/17587229



Published November 15, 2023 / Version 1.0.0

Full Data Release of the Day

Days Bay Collaboration

Contributors

Contact person: Dr. Yu. Zavadskiy | Search | About
Data manager: Zavadskiy, Vitalii

Full Data Release of the Day

Summary

The repository contains the full Days Bay data set of inner gadolinium. The dataset and supplementary data are with DOI:10.26434/chemrxiv-2023-10-123902.

The Days Bay Reactor Neutrino Experiment took data for gadolinium (Gd). This sample was collected by eight light scintillators between 400 m and 2 km. It covers 3158 days. Code is provided elsewhere to read the dataset and plot.

Citation statement

If you use the dataset, cite the following sources:

[1] Days Bay Collaboration, "Full Data Release of the Day"

[2] P. P. An et al. (Days Bay collaboration), "Precision like 100-10000 (2023)", DOI:10.1103/PhysRevAccelBeams.26.110101

The dataset organization

Files

Name	Size	Download all
Files (821.0 MB)		
dayabay_full_dataset_hdf5_1-0-0.zip		Download all
Files (821.0 MB)		
Name	Size	Download all
dayabay_analysis_dataset_hdf5_1-0-0.zip	1.3 MB	Preview Download
dayabay_analysis_dataset_npz_1-0-0.zip	1.4 MB	Preview Download
dayabay_analysis_dataset_root_1-0-0.zip	1.3 MB	Preview Download
dayabay_analysis_dataset_tsv_1-0-0.zip	1.5 MB	Preview Download
dayabay_full_dataset_hdf5_1-0-0.zip	203.0 MB	Preview Download
dayabay_full_dataset_npz_1-0-0.zip	203.4 MB	Preview Download
dayabay_full_dataset_root_1-0-0.zip	189.0 MB	Preview Download
dayabay_full_dataset_tsv_1-0-0.zip	220.1 MB	Preview Download

```
dataset_info.yaml
dayabay_dataset
├── dayabay_background_rates.hdf5
├── dayabay_background_spectra_6AD.hdf5
├── dayabay_background_spectra_7AD.hdf5
├── dayabay_background_spectra_8AD.hdf5
├── dayabay_daily_detector_data.hdf5
├── dayabay_events_AD11.hdf5
├── dayabay_events_AD12.hdf5
├── dayabay_events_AD21.hdf5
├── dayabay_events_AD22.hdf5
├── dayabay_events_AD31.hdf5
├── dayabay_events_AD32.hdf5
├── dayabay_events_AD33.hdf5
├── dayabay_events_AD34.hdf5
├── dayabay_ldb_spectra_6AD.hdf5
├── dayabay_ldb_spectra_7AD.hdf5
├── dayabay_ldb_spectra_8AD.hdf5
├── dayabay_ldb_spectra_total.hdf5
├── detector_lav_matrix.hdf5
├── detector_lsml_curves.hdf5
├── neutrino_rate.hdf5
├── nonequilibrium_correction.hdf5
├── parameters
├── antineutrinos_per_fission_huber_mueller.yaml
├── background_rate_scale_accidents.yaml
├── background_rates_correlated.yaml
├── background_rates_uncorrelated.yaml
├── background_rate_uncertainty_scale_smc.yaml
├── background_rate_uncertainty_scale_site.yaml
├── baselines.yaml
├── conversion_survival_probability_argument.py
├── conversion_thermal_power.py
├── detector_efficiency.yaml
├── detector_eres.yaml
├── detector_lav_offdiag_scale.yaml
├── detector_lsml.yaml
├── detector_normalization.yaml
├── detector_n_protons_correction.yaml
├── detector_n_protons_nominal.yaml
├── detector_relative.yaml
├── extra
├── detector_absolute.yaml
├── final_erec_bin_edges.tsv
├── ldb_constants.yaml
├── pdg2024.yaml
├── reactor_antineutrino_spectrum_edges.tsv
├── reactor_energy_per_fission.yaml
├── reactor_fission_fractions_scale.yaml
├── reactor_fission_fractions.yaml
├── reactor_nonequilibrium_correction.yaml
├── reactor_snf.yaml
├── reactor_thermal_power_nominal.yaml
├── reactor_thermal_power_uncertainty.yaml
├── survival_probability_constants.yaml
├── survival_probability_solar.yaml
├── survival_probability.yaml
├── reactor_antineutrino_spectra_hm.hdf5
├── reactor_antineutrino_spectra_hm_uncertainties.hdf5
└── README_dataset.md
```

Zenodo dataset: zenodo.org/records/17587229

Blue links are clickable

Dataset: complete and light versions

Overview

Three periods of data taking (final-state neutron captured on gadolinium)

- 3 near + 3 far detectors: 0 – 210 days
 - 4 near + 4 far detectors: 300 – 1820 days
 - 3 near + 4 far detectors: 1850 – 3280 days
- 3158 days of operation

	Hall 1	Hall 2	Hall 3
Number of detectors	2	2	4
IBD candidates	2 236 810	2 544 894	764 414
ν_e rate [day^{-1}]	1342.29	1191.18	300.57
Background rate [day^{-1}]	21.93	16.20	4.47
Background / Signal ratio, %	1.63	1.36	1.58

■ **Zenodo dataset** (full+light): zenodo.org/records/17587229

■ **PyPI dataset** (light): pypi.org/project/dayabay-data-official

Dataset: complete and light versions

Overview

The screenshot shows the PyPI project page for `dayabay-data-official` version 1.0.1. The page features a blue header with a search bar and navigation links (Help, Docs, Sponsors, Log in, Register). Below the header, the project name and version are displayed, along with a green 'Latest version' button and the release date (Dec 9, 2025). A prominent yellow banner at the top promotes PyCon US 2026 tickets. The main content area includes a navigation sidebar with options like 'Project description', 'Release history', and 'Download files'. The 'Project description' section is active, showing the full data release details.

Navigation

Project description

Release history

Download files

Verified details

These details have been verified by PyPI

Owner

Daya Bay Reactor Neutrino Experiment

Maintainers

zavadskyi

Project description

Full Data Release of the Daya Bay Reactor Neutrino Experiment

zenodo data github data pypi data github code pypi code License CC BY 4.0

Summary

The repository contains the full (analysis) Daya Bay data set of inverse-beta-decay (IBD) candidates (reactor electron antineutrino interactions) with the final-state neutron captured on gadolinium. The dataset and supplementary data are sufficient to reproduce the measurement of neutrino oscillation parameters $\sin^2 2\theta_{13}$ and Δm^2_{23} , published in [Phys. Rev. Lett. 130 \(2023\) 16.161802](#).

The Daya Bay Reactor Neutrino Experiment took data from 2011 to 2020 in China. It obtained a sample of 5.55 million IBD events with the final-state neutron captured on gadolinium (nGd). This sample was collected by eight identically designed antineutrino detectors (AD) observing antineutrino flux from six nuclear power plants located at baselines between 400 m and 2 km. It covers 3158 days of operation.

Code is provided elsewhere to read the dataset and produce a measurement of $\sin^2 2\theta_{13}$ and Δm^2_{23} , consistent with the publication.

PyPI dataset: pypi.org/project/dayabay-data-official

Blue links are clickable

Dataset: complete and light versions

Overview

Navigation

- Project description
- Release history
- Download files

Verified details

These details have been verified by PyPI

Owner

Daya Bay Reactor Neutrino Experiment

Maintainers

zavadskyi

Project description

Full Data Release of the Daya Bay Reactor Neutrino Experiment

zenodo data github data pypi data github code pypi code license CC BY 4.0

Summary

The repository contains the full (analysis) Daya Bay data set of inverse-beta-decay (IBD) candidates (reactor electron antineutrino interactions) with the final-state neutron captured on gadolinium. The dataset and supplementary data are sufficient to reproduce the measurement of neutrino oscillation parameters $\sin^2 2\theta_{13}$ and Δm^2_{23} , published in [Phys.Rev.Lett. 130 \(2023\) 16.161802](#).

The Daya Bay Reactor Neutrino Experiment took data from 2011 to 2020 in China. It obtained a sample of 5.55 million IBD events with the final-state neutron captured on gadolinium (nGd). This sample was collected by eight identically designed antineutrino detectors (AD) observing antineutrino flux from six nuclear power plants located at baselines between 400 m and 2 km. It covers 3158 days of operation.

Code is provided elsewhere to read the dataset and produce a measurement of $\sin^2 2\theta_{13}$ and Δm^2_{23} , consistent with the publication.

```
dataset_info.yaml
dayabay_dataset
- dayabay_background_rates.hdf5
- dayabay_background_spectra_6AD.hdf5
- dayabay_background_spectra_7AD.hdf5
- dayabay_background_spectra_8AD.hdf5
- dayabay_daily_detector_data.hdf5
- dayabay_ibd_spectra_6AD.hdf5
- dayabay_ibd_spectra_7AD.hdf5
- dayabay_ibd_spectra_8AD.hdf5
- dayabay_ibd_spectra_total.hdf5
detector_iav_matrix.hdf5
detector_lsn_curves.hdf5
neutrino_rate.hdf5
nonequilibrium_correction.hdf5
parameters
- antineutrinos_per_fission_huber_sueller.yaml
- background_rate_scale_accidentals.yaml
- background_rates_correlated.yaml
- background_rates_uncorrelated.yaml
- background_rate_uncertainty_scaleAnc.yaml
- background_rate_uncertainty_scale_site.yaml
- baselines.yaml
- conversion_survival_probability_argument.py
- conversion_thermal_power.py
- detector_efficiency.yaml
- detector_eres.yaml
- detector_iav_offdiag_scale.yaml
- detector_lsn.yaml
- detector_normalization.yaml
- detector_n_protons_correction.yaml
- detector_n_protons_nominal.yaml
- detector_relative.yaml
extra
- detector_absolute.yaml
- final_erec_bin_edges.tsv
- ibd_constants.yaml
- pg2824.yaml
- reactor_antineutrino_spectrum_edges.tsv
- reactor_energy_per_fission.yaml
- reactor_fission_fractions_scale.yaml
- reactor_fission_fractions.yaml
- reactor_nonequilibrium_correction.yaml
- reactor_snf.yaml
- reactor_thermal_power_nominal.yaml
- reactor_thermal_power_uncertainty.yaml
- survival_probability_constants.yaml
- survival_probability_solar.yaml
- survival_probability.yaml
- reactor_antineutrino_spectra_ha.hdf5
- reactor_antineutrino_spectra_ha_uncertainties.hdf5
README_dataset.md
README.md
snf_correction.hdf5
```

PyPI dataset: pypi.org/project/dayabay-data-official

Blue links are clickable

Dataset: complete and light versions

Examples of reproducing the Daya Bay results with light dataset

- Following slides demonstrate possibility to obtain oscillation results and features of spectrum measurements
- We used light dataset to produce results
- Results were obtained with open model and they are in a good agreement with official

Dataset: complete and light versions

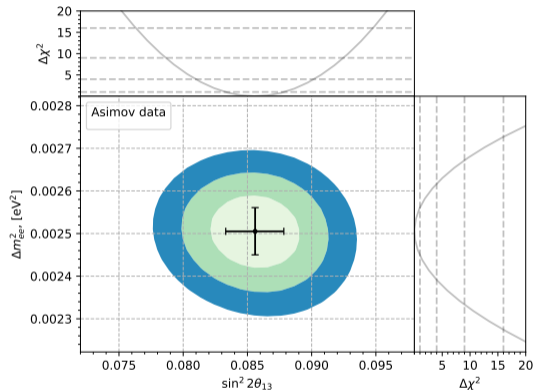
Examples of reproducing the Daya Bay results with light dataset

- Light dataset is sufficient for oscillation analysis
 - > Open Daya Bay model:
[pypi.org:project/dayabay-model](https://pypi.org/project/dayabay-model)
- Reproduces [PRL 130, 161802 \(2023\)](#)

Dataset: complete and light versions

Examples of reproducing the Daya Bay results with light dataset

- Light dataset is sufficient for oscillation analysis
 - > Open Daya Bay model:
[pypi.org:project/dayabay-model](https://pypi.org/project/dayabay-model)
- Reproduces [PRL 130, 161802 \(2023\)](#)
- Fit script: [github:dagflow-team/dayabay-analysis/scripts/fit_dayabay_iminuit_data.sh](https://github.com/dagflow-team/dayabay-analysis/scripts/fit_dayabay_iminuit_data.sh)



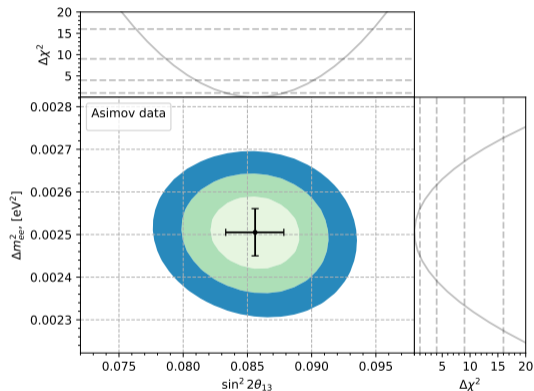
$$\begin{aligned} & |(\Delta m_{ee}^2)^{\text{official}} - (\Delta m_{ee}^2)^{\text{obtained}}| / (\sigma(\Delta m_{ee}^2)^{\text{official}}) < 0.1 \\ & |(\sin^2 2\theta_{13})^{\text{official}} - (\sin^2 2\theta_{13})^{\text{obtained}}| / (\sigma(\sin^2 2\theta_{13})^{\text{official}}) < 0.1 \end{aligned}$$

Obtained with [dayabay-model](#)

Dataset: complete and light versions

Examples of reproducing the Daya Bay results with light dataset

- Light dataset is sufficient for oscillation analysis
 - Open Daya Bay model:
[pypi.org:project/dayabay-model](https://pypi.org/project/dayabay-model)
- Reproduces [PRL 130, 161802 \(2023\)](#)
- Fit script: [github:dagflow-team/dayabay-analysis/scripts/fit_dayabay_iminuit_data.sh](https://github.com/dagflow-team/dayabay-analysis/scripts/fit_dayabay_iminuit_data.sh)
- Contour script:
[github:dagflow-team/dayabay-analysis/scripts/plot_dayabay_fit_contour.sh](https://github.com/dagflow-team/dayabay-analysis/scripts/plot_dayabay_fit_contour.sh)



$$|(\Delta m_{ee}^2)^{\text{official}} - (\Delta m_{ee}^2)^{\text{obtained}}| / (\sigma(\Delta m_{ee}^2)^{\text{official}}) < 0.1$$

$$|(\sin^2 2\theta_{13})^{\text{official}} - (\sin^2 2\theta_{13})^{\text{obtained}}| / (\sigma(\sin^2 2\theta_{13})^{\text{official}}) < 0.1$$

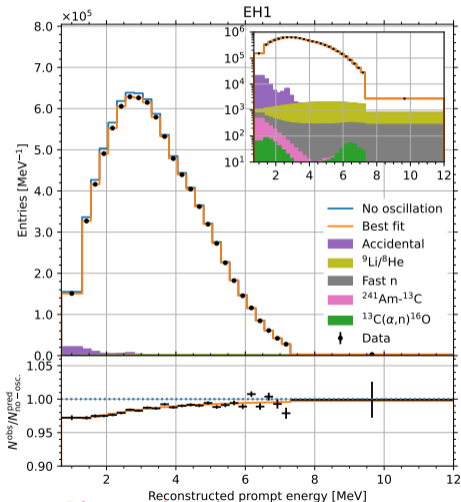
Obtained with [dayabay-model](#)

Dataset: complete and light versions

Examples of reproducing the Daya Bay results with light dataset

- Light dataset is sufficient for oscillation analysis
 - > Open Daya Bay model:
[pypi.org:project/dayabay-model](https://pypi.org/project/dayabay-model)
- Reproduces [PRL 130, 161802 \(2023\)](#)
- Fit script: [github:dagflow-team/dayabay-analysis/scripts/fit_dayabay_iminuit_data.sh](https://github.com/dagflow-team/dayabay-analysis/scripts/fit_dayabay_iminuit_data.sh)
- Contour script:
[github:dagflow-team/dayabay-analysis/scripts/plot_dayabay_fit_contour.sh](https://github.com/dagflow-team/dayabay-analysis/scripts/plot_dayabay_fit_contour.sh)
- Spectrum script:
[github:dagflow-team/dayabay-analysis/scripts/plot_dayabay_fit_spectrum.sh](https://github.com/dagflow-team/dayabay-analysis/scripts/plot_dayabay_fit_spectrum.sh)

Blue links are clickable

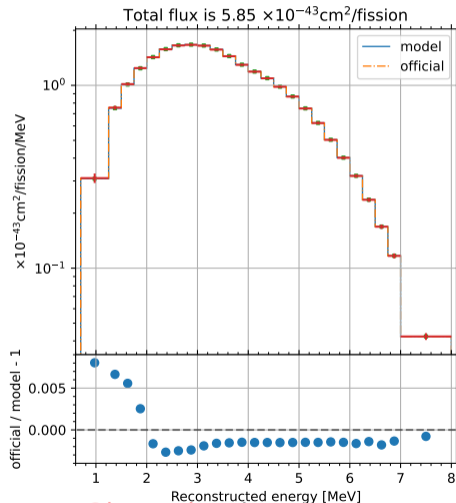


Obtained with dayabay-model

Dataset: complete and light versions

Examples of reproducing the Daya Bay results with light dataset

- Reproduces [PRL 134, 201802 \(2025\)](#)
 - > $\sigma_f = [5.84 \pm 0.07] \times 10^{43} \text{cm}^2/\text{fission}$

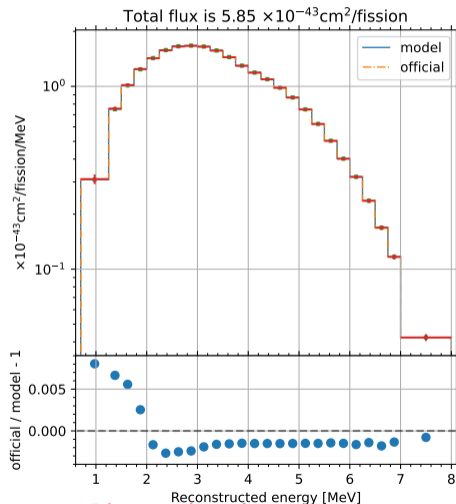


Obtained with dayabay-model

Dataset: complete and light versions

Examples of reproducing the Daya Bay results with light dataset

- Reproduces [PRL 134, 201802 \(2025\)](#)
 - > $\sigma_f = [5.84 \pm 0.07] \times 10^{43} \text{cm}^2/\text{fission}$
- Spectrum script:
[github:dagflow-team/dayabay-analysis-extra/scripts/prl_134_201802.sh](https://github.com/dagflow-team/dayabay-analysis-extra/scripts/prl_134_201802.sh)

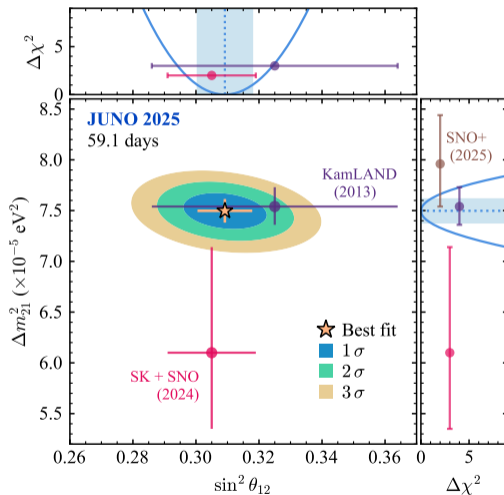


Obtained with dayabay-model

Dataset: complete and light versions

Examples of reproducing the Daya Bay results with light dataset

- Reproduces [PRL 134, 201802 \(2025\)](#)
 - > $\sigma_f = [5.84 \pm 0.07] \times 10^{43} \text{cm}^2/\text{fission}$
- Spectrum script:
[github:dagflow-team/dayabay-analysis-extra/scripts/prl_134_201802.sh](https://github.com/dagflow-team/dayabay-analysis-extra/scripts/prl_134_201802.sh)
- Combined analysis with other experiments: JUNO, [arXiv:2511.14593](https://arxiv.org/abs/2511.14593)
 - > [Dmitry's morning talk](#)
 - > Presented model may be auxiliary to obtaining first oscillation measurements of JUNO

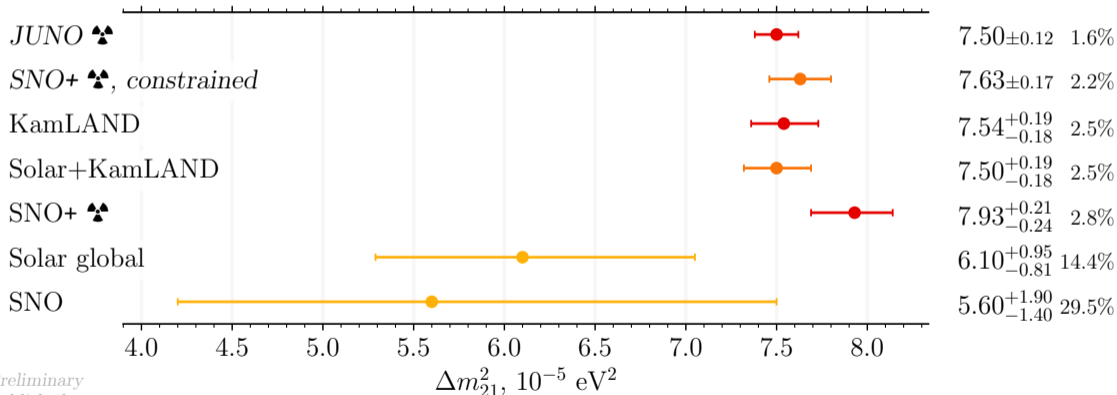


Blue links are clickable

Dataset: complete and light versions

Examples of reproducing the Daya Bay results with light dataset

■ Reproduces PRL 134, 201802 (2025)



v9 2025.11: git.jinr.ru/mu/osc

Preliminary
Published

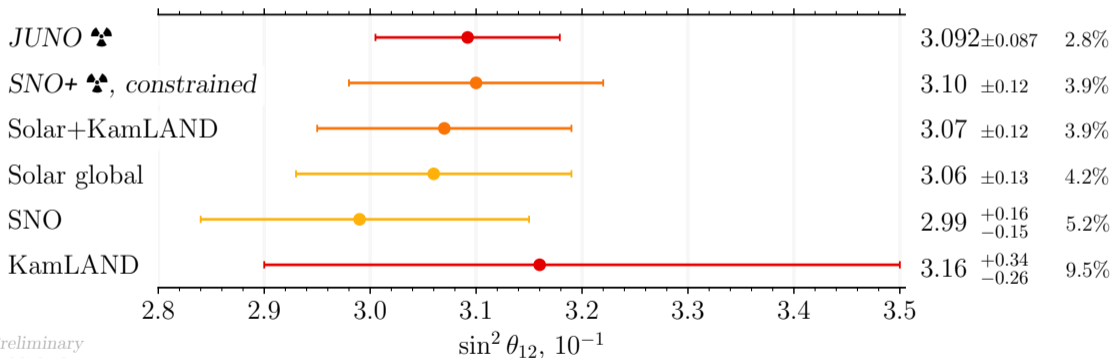
First measurement of reactor neutrino oscillations at JUNO, [arXiv:2511.14593](https://arxiv.org/abs/2511.14593)

Blue links are clickable

Dataset: complete and light versions

Examples of reproducing the Daya Bay results with light dataset

■ Reproduces PRL 134, 201802 (2025)



v7 2025.11: git.jinr.ru/mu/osc

Preliminary
Published

First measurement of reactor neutrino oscillations at JUNO, [arXiv:2511.14593](https://arxiv.org/abs/2511.14593)

Blue links are clickable

Dataset: complete and light versions

Features of the complete dataset

■ Complete tree of events in each detector: `dayabay_dataset/dayabay_events_AD??.*`

	time_prompt_s	day	n_det	energy_prompt_MeV	energy_delayed_MeV	delta_t_us	vertex_prompt_x_mm	vertex_prompt_y_mm	vertex_prompt_z_mm	vertex_delayed_x_mm	vertex_delayed_y_mm	vertex_delayed_z_mm
0	1324738631	0	6	4.39337	7.83360	21.875000	517.856018	-1408.620000	-33.650303	354.155975	-1100.270020	-93.051796
1	1324738749	0	6	3.81000	7.86787	18.775000	-939.942017	484.862000	234.387007	-955.195007	579.851990	187.132996
2	1324738785	0	6	4.72838	8.46890	14.425000	-1235.020020	778.002002	-929.328979	-1275.489998	382.811005	-1020.560000
3	1324738845	0	6	2.07176	7.85049	10.225000	-729.406982	862.734009	728.264954	-606.479004	898.222961	373.078003
4	1324738994	0	6	3.65298	7.75185	19.636999	357.983002	-985.466003	727.158997	334.113007	-988.519043	729.554016
5	1324739077	0	6	4.20659	8.75522	17.462999	1052.899900	629.765991	690.513000	735.341003	679.693970	857.895020
6	1324739099	0	6	4.62233	8.08920	25.938000	-350.708000	1019.109990	-499.597015	-382.329987	897.490051	-625.255005
7	1324739240	0	6	3.64674	8.09229	12.225000	-383.776001	-843.352966	756.026978	-398.002002	-476.814972	849.666016
8	1324739324	0	6	3.71787	8.23607	6.350000	-256.671021	500.930019	-438.725006	-30.413001	493.205017	-519.990051
9	1324739484	0	6	2.29680	7.62999	08.987999	-1162.479900	-917.110046	1049.710000	-1189.370000	-991.500000	867.519950
10	1324739724	0	6	4.74218	8.71548	47.562000	-1037.829960	-143.820007	1220.770020	-1144.800000	-190.007004	1102.409990
11	1324740177	0	6	2.27398	8.07145	18.900000	-101.634003	-927.519950	-231.612991	-15.152300	-1014.600050	-172.507996
12	1324740334	0	6	2.45659	8.05936	6.400000	793.704956	805.320007	69.171799	857.210018	1147.000060	-663.034973
13	1324740561	0	6	4.38522	6.94963	22.430000	-186.188995	1246.160030	-442.225983	-104.260997	1375.470090	-239.392990
14	1324740804	0	6	5.17950	7.93842	28.375000	-562.247986	1241.410030	993.145020	-660.976013	1102.669920	863.007024
15	1324740815	0	6	1.40974	6.42094	52.450000	864.442017	179.570999	-743.940975	1368.219970	-113.029000	-64.613502
16	1324740972	0	6	4.55045	7.64849	129.050003	-900.921997	-496.605011	-786.410030	-626.115051	-39.269501	-39.269501
17	1324741196	0	6	3.57428	8.26961	24.062000	733.659973	-303.307007	161.494003	1156.469970	-416.096000	-255.284012
18	1324741212	0	6	3.21946	7.71839	35.875000	991.835022	-715.706011	-491.725000	1166.020070	-610.206011	-314.162994
19	1324741505	0	6	2.61112	8.04346	16.180000	534.706011	200.266006	-1408.750000	692.330900	89.210693	-1034.350100

■ Possible to reproduce prompt signal at any step

- > Search for high energy $\bar{\nu}_e$ s
- > Directionality of neutrino flux

■ Time/position information might be used for searching anomalies, light dark matter, BSM, etc.

Dataset: complete and light versions

Features of the complete dataset

Complete tree of events in each de

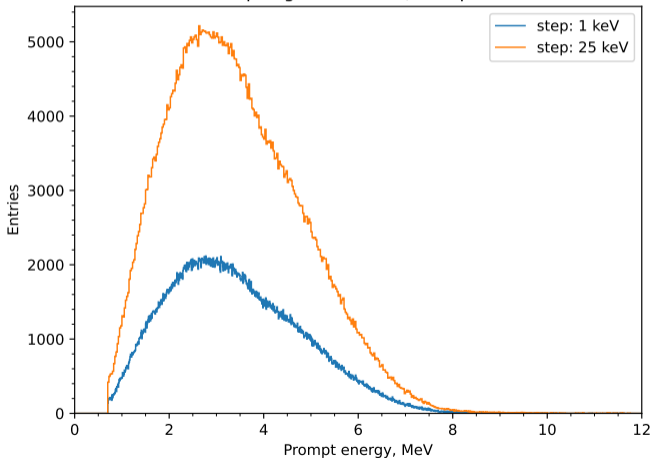
	time_prompt_s	day	n_det	energy_prompt_MeV	energy_delayed_MeV	delta_t
0	1324738631	0	6	4.39337	7.83368	21.8791
1	1324738749	0	6	3.81888	7.86787	18.7791
2	1324738785	0	6	4.72838	8.46898	14.4251
3	1324738845	0	6	2.87176	7.85849	18.2251
4	1324738994	0	6	3.65298	7.79185	19.6361
5	1324739877	0	6	4.28459	8.75522	17.4621
6	1324739899	0	6	4.62233	8.88928	25.9381
7	1324739248	0	6	3.64674	8.89229	12.2251
8	1324739324	0	6	3.71787	8.23687	6.3581
9	1324739484	0	6	2.29688	7.62999	88.9871
10	1324739724	0	6	4.74218	8.71548	47.5621
11	1324748177	0	6	2.27398	8.87145	18.9881
12	1324748334	0	6	2.45659	8.85936	6.4881
13	1324748561	0	6	4.38522	6.94963	22.6381
14	1324748884	0	6	5.17958	7.93842	28.3751
15	1324748815	0	6	1.48974	6.42894	52.4381
16	1324748972	0	6	4.55845	7.64849	129.8581
17	1324741196	0	6	3.57428	8.26961	24.8621
18	1324741212	0	6	3.21946	7.71839	35.8791
19	1324741585	0	6	2.61112	8.84346	16.1881

Possible to reproduce prompt signal:

- > Search for high energy $\bar{\nu}_e$ s
- > Directionality of neutrino flux

Time/position information might be useful for BSM, etc.

Prompt signal for AD11, 8AD-period



Summary

- Open Daya Bay dataset and model were published
 - + Good agreement with official results
 - > Dataset: [zenodo](#), [PyPI](#), [github](#)
 - > Model: [PyPI](#), [github](#), [gitlab@JINR](#)
 - > Examples: [github-1](#), [github-2](#), [gitlab-1@JINR](#), [gitlab-2@JINR](#)
 - > Citations: DOI:10.5281/zenodo.17587229; DOI: 10.1103/PhysRevLett.130.161802
- Reproduction of key results of last years were shown
- Possibility of search for BSM, combined analysis with other experiments

Blue links are clickable

- Open Daya Bay dataset and model were published
 - + Good agreement with official results
 - > Dataset: [zenodo](#), [PyPI](#), [github](#)
 - > Model: [PyPI](#), [github](#), [gitlab@JINR](#)
 - > Examples: [github-1](#), [github-2](#), [gitlab-1@JINR](#), [gitlab-2@JINR](#)
 - > Citations: DOI:10.5281/zenodo.17587229; DOI: 10.1103/PhysRevLett.130.161802
- Reproduction of key results of last years were shown
- Possibility of search for BSM, combined analysis with other experiments

Thank you for attention!