

Precision Measurement of Reactor Antineutrino Oscillation with Full Dataset at Daya Bay



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Daya Bay Reactor Neutrino Experiment

- Daya Bay took data from Dec 2011 to Dec 2020 and collected ~5.5 million antineutrino events in the full dataset
 - the largest sample of reactor antineutrinos to date
- Daya Bay achieved unprecedented precision in measuring the neutrino mixing angle θ_{13} and the neutrino mass-squared difference Δm^2_{32}
 - Eight identically designed underground detectors deployed at different baselines
 - Six 2.9 GW_{th} nuclear reactor cores
 - Near-far relative measurement: the key to reduce the reactor and detector related systematic uncertainties
 - Detection method: inverse beta decay (IBD) interaction with the final state neutron captured on gadolinium (nGd)



Daya Bay location

Overview of Full Dataset

• Three physics runs:

Configuration	EH1	EH2	EH3	Start data – End data	Duration (Days)
6-AD	2	1	3	24 Dec 2011 – 28 July 2012	217
8-AD	2	2	4	19 Oct 2012 – 26 Dec 2016	1524
7-AD	1	2	4	26 Jan 2017 – 12 Dec 2020	1417
Total					3158

- Data available for analyses: ~2700 days
- Correlation with operation of reactors
 - Expectation based on weekly reactor operational information
 - Measurements track expectations

- Energy calibration











