



Seismic Energy Forecast for Japan

2025 October 09, 2025 December 11-18 - potential
earthquake or eruption in Japan

Version: 0

First Revision: 2025-11-03 18:02:54

Last Revision: Rev. 0 - 2025-11-03 18:02

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1. Revision History

Vers ion	Date	Aut hor	Description
0	2025 - 11 - 03 18:02:54	MF	Seismic Energy Forecast for Potential Earthquake or Eruption in Japan
	first emission		

2. Explanation of Terms and Concepts

About Features used to produce this forecast

We produced this forecast using the following specific source:

1. astronomical solar system data (same day - 0 shift)
2. seismic sensor GPS data (60 days shift)
3. tropospheric data (60 days shift)

The Purpose it to demonstrate the validity of using GPS + TROPO data several week before a seismic event.

Time series sharpness achievable by astronomical data only can be up to 7 days.

This study demonstrate that using augmented data in past geophysical observations can rise the time line sharpness up to 24 hrs and more.

About Graph system

*Note: **trend** graph*

Forecast graph and tables refer to a base value, against it.

For instance if a value of 37 per latitude is the base line and graph value is 0% it means that the location estimated for that period of time is UNDER 37.

Another example is for magnitude graph, with baseline Mw 7.0, 0% means no risk detected, and 100% means high risk detected

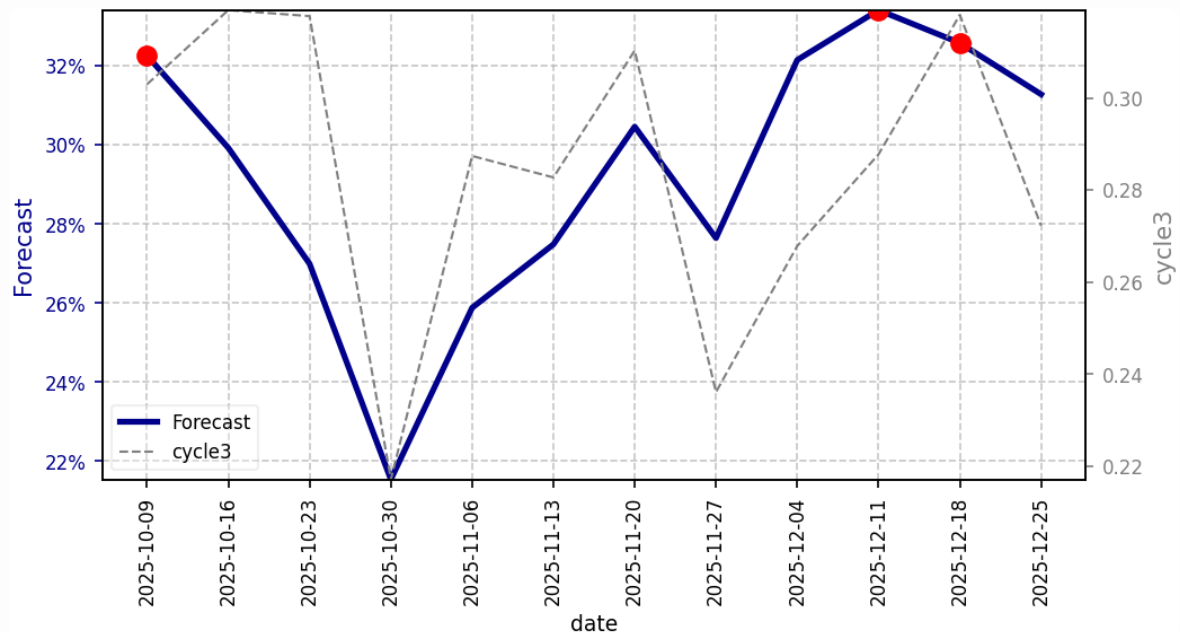
About Time Slot

*Note: each date point represent **the beginning of the time slot***

For instance if a forecast time point is on 2025-01-01 and the graph resolution is 7 days, it's a forecast for 2025-01-01 until 2025-01-06 (UTC)

3. Forecasts

3.1 Seismic Energy Forecast (possible earthquake or eruption), res:1 week, UTC (focus: cycle3)



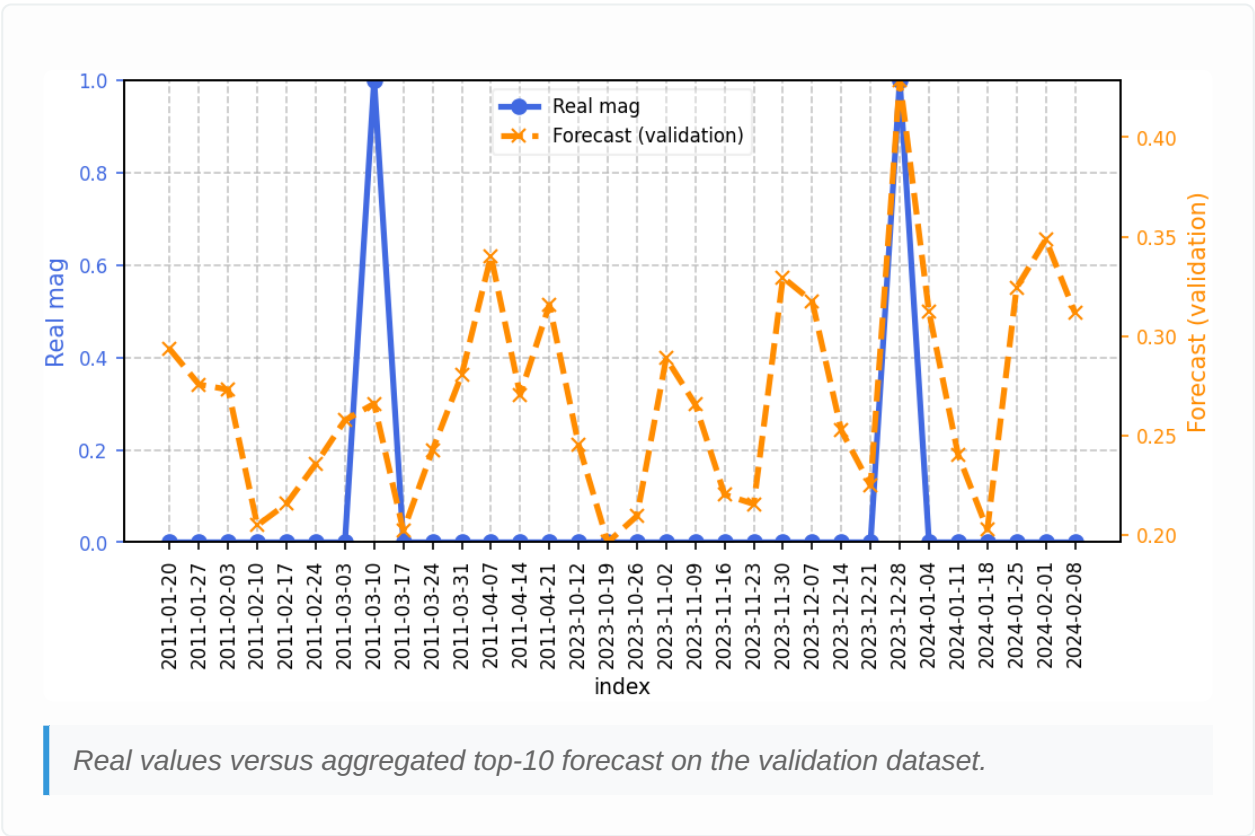
⚠ Higher Risk Detected for Following Dates:

- 1. from 2025-12-11 to 2025-12-18 (UTC) - Risk Value: 0.334
- 2. from 2025-12-18 to 2025-12-25 (UTC) - Risk Value: 0.326
- 3. from 2025-10-09 to 2025-10-16 (UTC) - Risk Value: 0.323

Each date represent the BEGINNING of time slot

This seismic energy forecast highlights potential earthquakes or eruptions in Japan.

3.2 Validation Quality Check



4. Features Used For Magnitude

Combined Features Analysis Report - trialsetJAPAN-M75- COMBINED_20251103-174258

Generated: 2025-11-05T22:55:30.156136 **Cycles Analyzed:** explore, cycle1, cycle2, cycle3, cycle4

EXPLORE Analysis

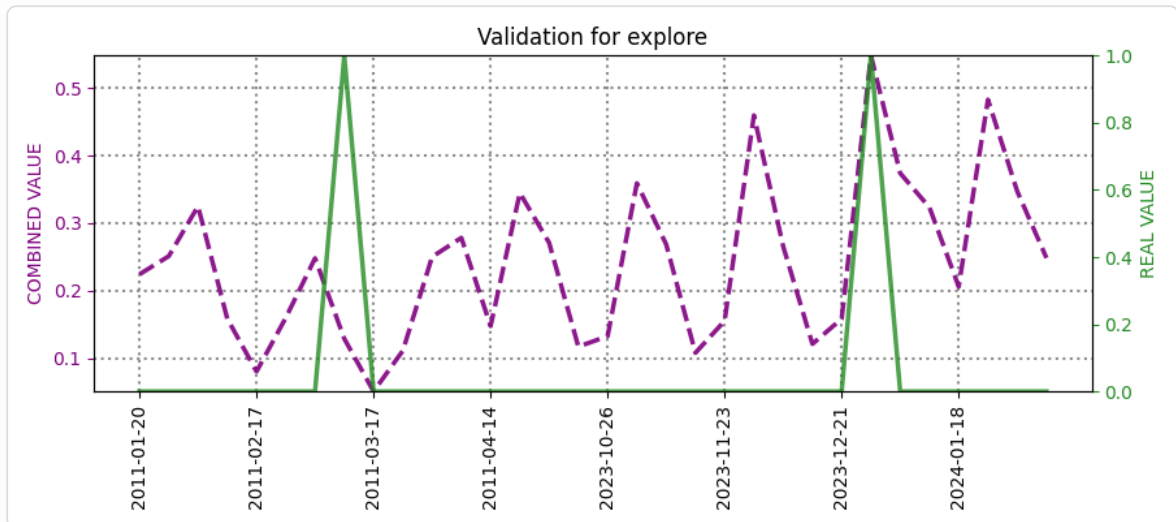
Trial Statistics

Metric	Min	Max	Average
Hyperopt Loss (lower is better)	0.65	1.46	0.87
Metric Score (cost_sensitive+precision+mcc) (lower is better)	0.53	0.58	0.56

Contribution Type	Trials
Direct	10
Inverted	0

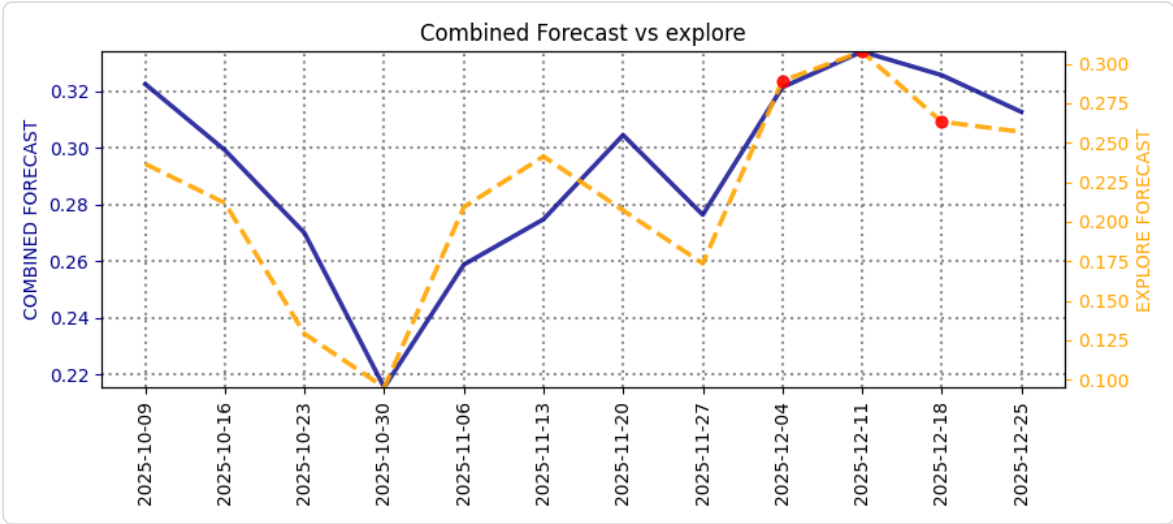
Validation Analysis

Best trial validation for this cycle contrasted with real values.



Forecast Analysis

Best trial forecast for this cycle versus the combined forecast.



Complete Dataset Overview

Analysis of ALL features present in the source files

	Astro	Tropo	Pos
Count	17	0	0
Percentage	85.0%	0.0%	0.0%

Summary Insights

Complete Dataset:

- **Astronomical data** represents 85.0% of all features (17 features)
 - **Target variables** represent 10.0% of all features (2 features)
 - **Dominant category in complete dataset:** Astro features
-

CYCLE1 Analysis

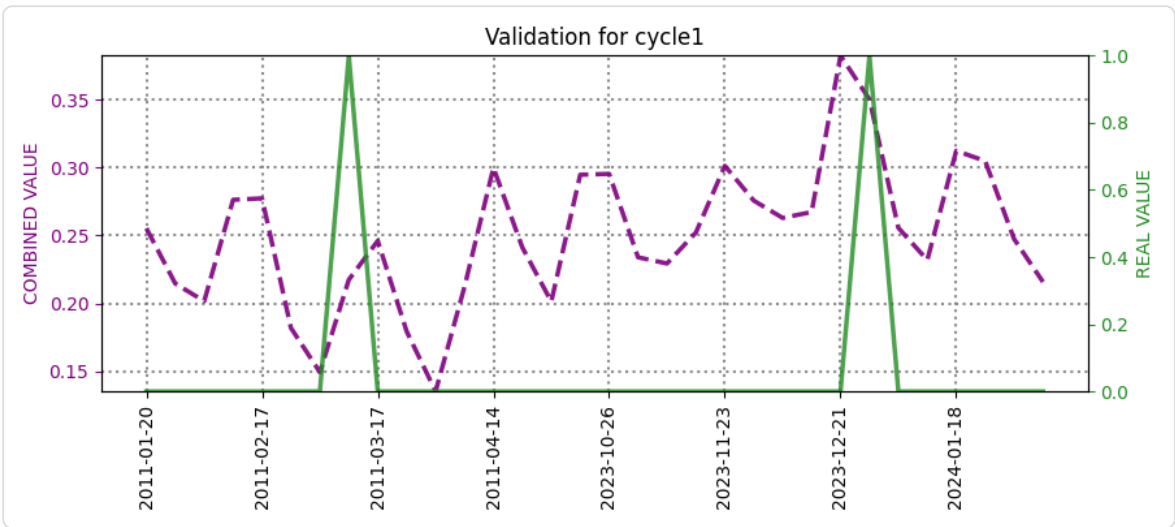
Trial Statistics

Metric	Min	Max	Average
Hyperopt Loss (lower is better)	0.52	1.32	0.78
Metric Score (cost_sensitive+precision+mcc) (lower is better)	0.43	0.66	0.60

Contribution Type	Trials
Direct	10
Inverted	0

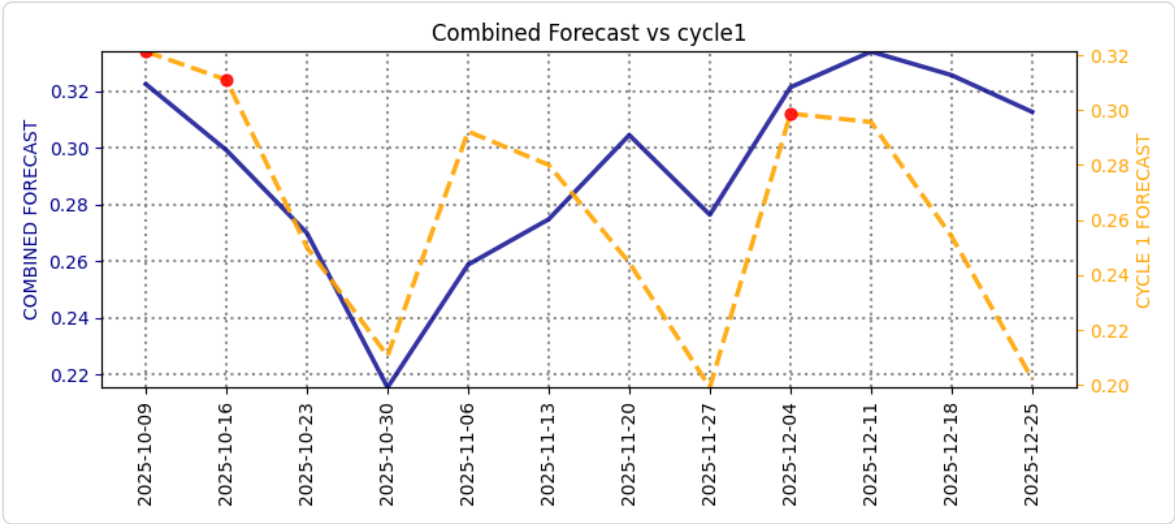
Validation Analysis

Best trial validation for this cycle contrasted with real values.



Forecast Analysis

Best trial forecast for this cycle versus the combined forecast.



Complete Dataset Overview

Analysis of ALL features present in the source files

	Astro	Tropo	Pos
Count	22	0	0
Percentage	88.0%	0.0%	0.0%

Summary Insights

Complete Dataset:

- **Astronomical data** represents 88.0% of all features (22 features)
 - **Target variables** represent 8.0% of all features (2 features)
 - **Dominant category in complete dataset:** Astro features
-

CYCLE2 Analysis

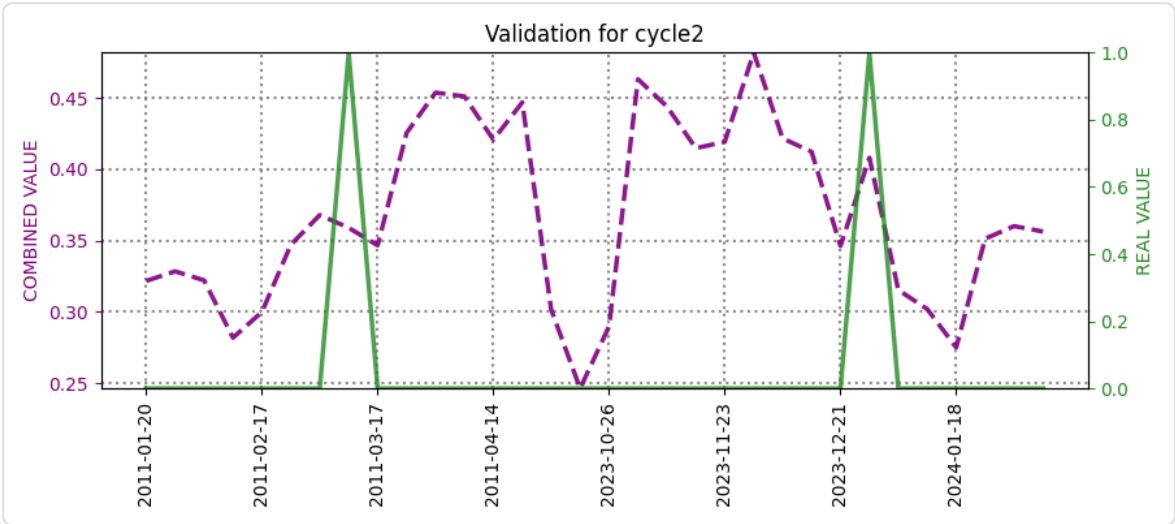
Trial Statistics

Metric	Min	Max	Average
Hyperopt Loss (lower is better)	0.54	1.02	0.73
Metric Score (cost_sensitive+precision+mcc) (lower is better)	0.48	0.62	0.56

Contribution Type	Trials
Direct	10
Inverted	0

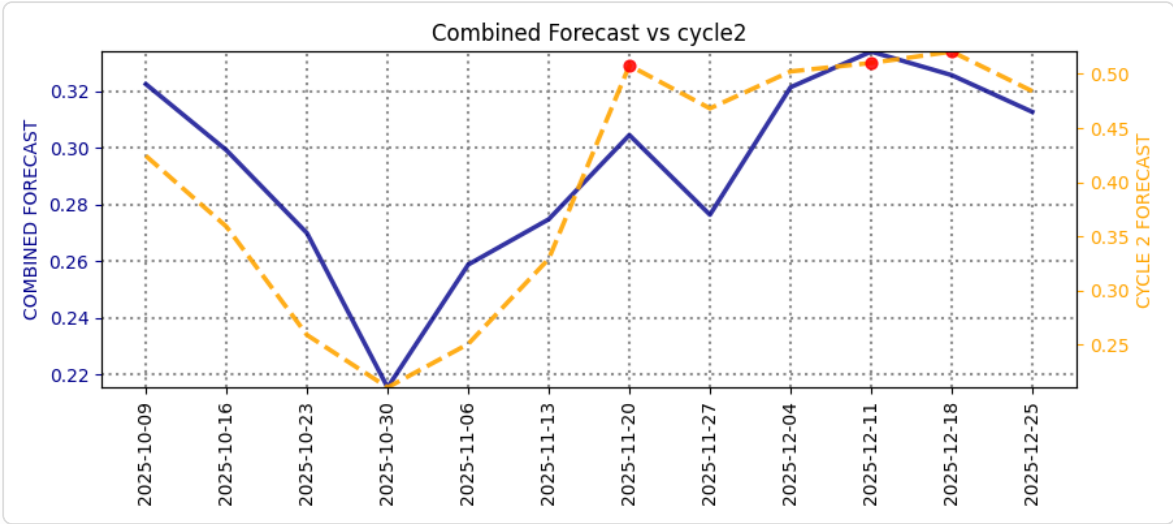
Validation Analysis

Best trial validation for this cycle contrasted with real values.



Forecast Analysis

Best trial forecast for this cycle versus the combined forecast.



Complete Dataset Overview

Analysis of ALL features present in the source files

	Astro	Tropo	Pos
Count	22	0	0
Percentage	88.0%	0.0%	0.0%

Summary Insights

Complete Dataset:

- **Astronomical data** represents 88.0% of all features (22 features)
 - **Target variables** represent 8.0% of all features (2 features)
 - **Dominant category in complete dataset:** Astro features
-

CYCLE3 Analysis

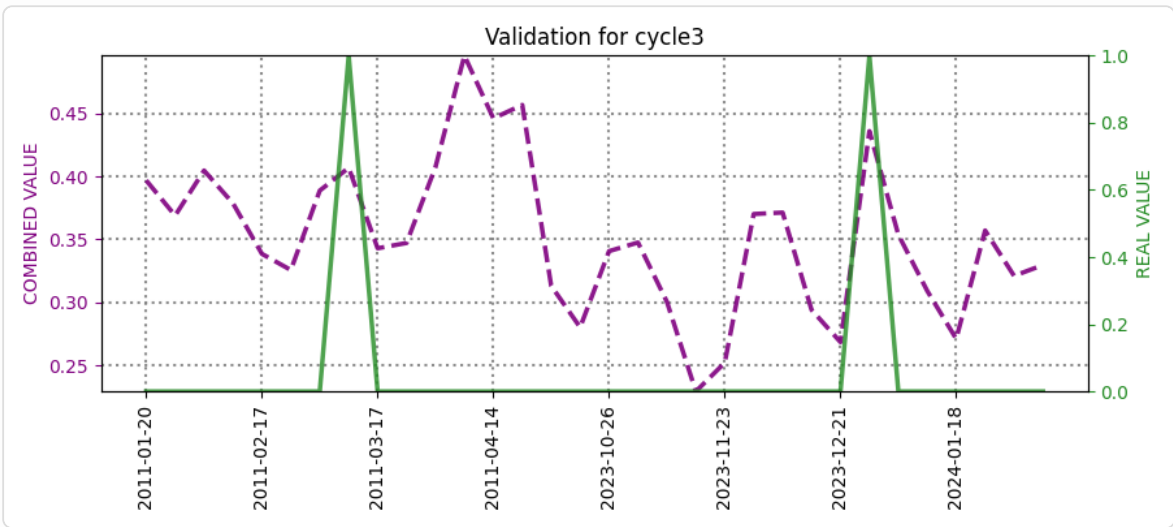
Trial Statistics

Metric	Min	Max	Average
Hyperopt Loss (lower is better)	0.49	0.84	0.59
Metric Score (cost_sensitive+precision+mcc) (lower is better)	0.48	0.57	0.52

Contribution Type	Trials
Direct	10
Inverted	0

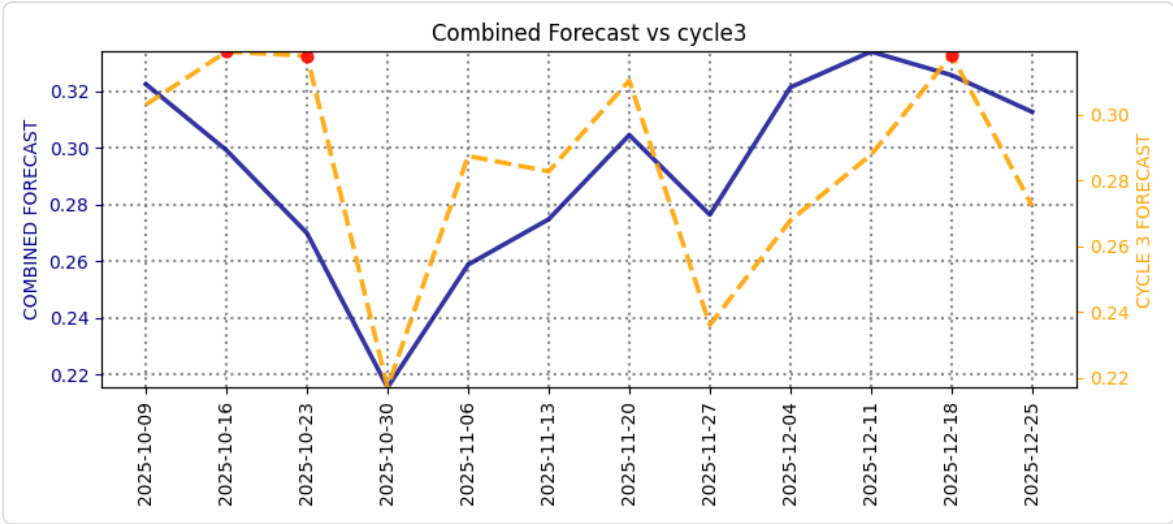
Validation Analysis

Best trial validation for this cycle contrasted with real values.



Forecast Analysis

Best trial forecast for this cycle versus the combined forecast.



Complete Dataset Overview

Analysis of ALL features present in the source files

	Astro	Tropo	Pos
Count	21	0	0
Percentage	87.5%	0.0%	0.0%

Summary Insights

Complete Dataset:

- **Astronomical data** represents 87.5% of all features (21 features)
 - **Target variables** represent 8.3% of all features (2 features)
 - **Dominant category in complete dataset:** Astro features
-

CYCLE4 Analysis

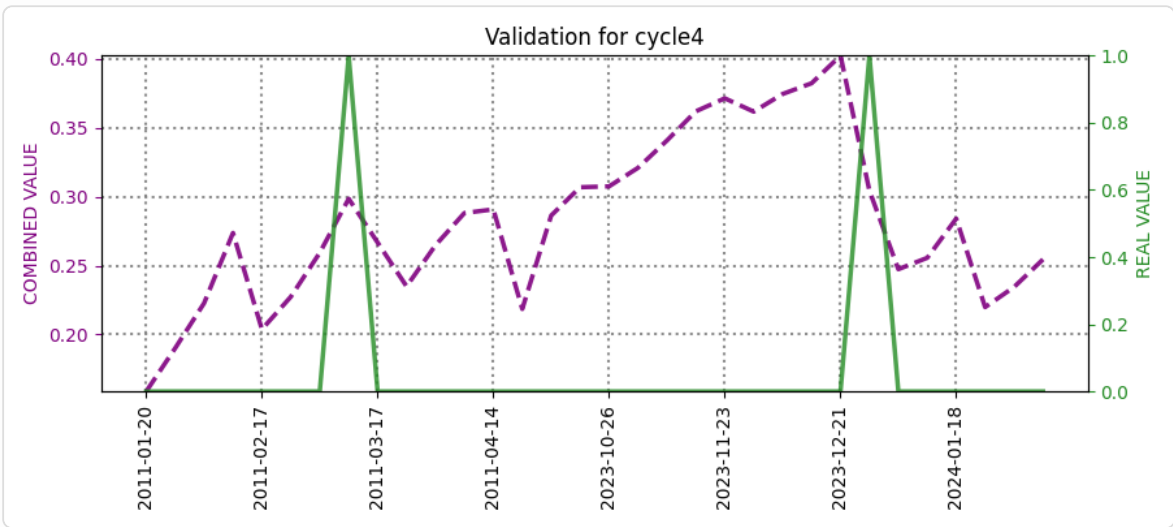
Trial Statistics

Metric	Min	Max	Average
Hyperopt Loss (lower is better)	0.51	1.27	0.74
Metric Score (cost_sensitive+precision+mcc) (lower is better)	0.48	0.62	0.59

Contribution Type	Trials
Direct	10
Inverted	0

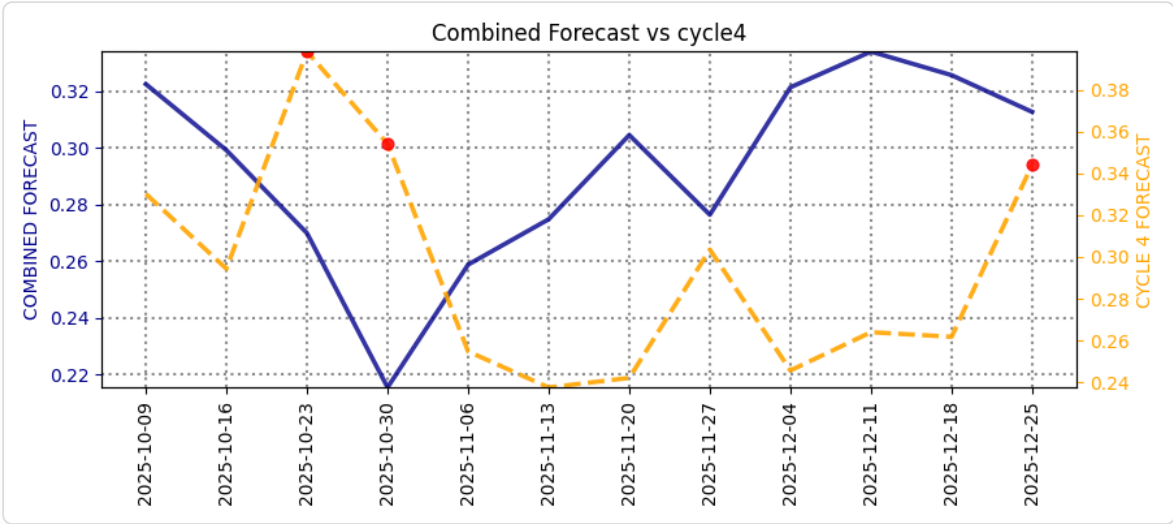
Validation Analysis

Best trial validation for this cycle contrasted with real values.



Forecast Analysis

Best trial forecast for this cycle versus the combined forecast.



Complete Dataset Overview

Analysis of ALL features present in the source files

	Astro	Tropo	Pos
Count	22	0	0
Percentage	88.0%	0.0%	0.0%

Summary Insights

Complete Dataset:

- **Astronomical data** represents 88.0% of all features (22 features)
- **Target variables** represent 8.0% of all features (2 features)
- **Dominant category in complete dataset:** Astro features

Cross-Cycle Summary

Cycle	Best Trial	GPS Features	Tropo Features	Astro Features	Hyperopt Loss	Metric Score (cost_sensitive+precision+mcc)	Hybrid Score
explore	317	N/A	N/A	17	0.68	0.53	0.60
cycle1	47	N/A	N/A	22	0.66	0.43	0.55
cycle2	57	N/A	N/A	22	0.54	0.51	0.52
cycle3	114	N/A	N/A	21	0.49	0.48	0.48
cycle4	135	N/A	N/A	22	0.51	0.48	0.50

5. Astronomical Features Used

Astronomical Features Used per Cycle - trialsetJAPAN-M75- COMBINED_20251103-174258

Focus cycle: cycle3

Cycle	Loss	Hybrid	Bodies	Observers	Ephemerides	Operations
explore	0.68	0.60	10, 199, 301	geo_35.6895;139.6917;0	az, dec_rate, delta, delta_rate, el, lunar_presence	max, min
cycle1	0.66	0.55	199, 301, 502, 699	geo_35.6895;139.6917;0	az, delta_rate, el, lunar_presence, ra_rate, velocitypa	min
cycle2	0.54	0.52	101955, 136199, 301, 499, 502	geo_35.6895;139.6917;0	az, dec_rate, delta_rate, lunar_presence, suntargetpa	min
cycle3	0.49	0.48	301, 499, 502, 599	geo_35.6895;139.6917;0	dec_rate, delta, delta_rate, suntargetpa, velocitypa	max, min
cycle4	0.51	0.50	136199, 301, 499, 502, 599	geo_35.6895;139.6917;0	az, dec_rate, lunar_presence, suntargetpa, velocitypa	min

Bodies are represented by their NAIF ID (unique identifiers for celestial bodies from NASA/JPL); observers use geo_lat;lon;height schema. Ephemerides are Horizons fields; operations are aggregations like min/max.

6. Summary and Conclusion

Summary of Findings

Elevated seismic energy suggests potential earthquakes or eruptions in Japan.
Peak dates: 2025-10-09, 2025-12-11, 2025-12-18 (UTC).

Conclusions

Increased seismic energy indicates potential earthquakes or eruptions for
2025-10-09, 2025-12-11, 2025-12-18 in Japan.

Even if the risk appears slight or moderate, preparation is necessary because the epicenter could be near your location. A separate report is required to estimate its position. AI-generated reports may create false alarms or underestimate the risks. Do not use this report to make important decisions. This work is for research purposes only.

7. Attribution and Disclaimers

Data Sources

- Seismic data utilized in this report is sourced from the **USGS Earthquake Catalog** and the **Japan Meteorological Agency (JMA)**.
- Planetary ephemeris data provided by **NASA/JPL Horizons System**.
- All tropo + gps positional data provided by **NASA/JPL**

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Responsibility Statement

The analysis and conclusions represent the best judgment of our research team based on the available data. This is not an official warning or alert. For official information, please consult your local government and geological survey authorities.