

# HADRON Enhancement Report

Public-safe evaluation output



**STRONG**

Strong enhancement with improved separability and preserved waveform morphology.

Median power SNR gain: 11.83 dB (95% CI 11.57 to 12.34)

Median peak-to-RMS: 42.27 dB (95% CI 41.23 to 43.18)

Signal/noise AUC: 1.00 (95% CI 1.00 to 1.00)

Channels x samples: 300 x 4,000

Sample rate: 100 Hz

Metric scope: windowed signal-quality evaluation for this input/run.

Report generated

2026-04-29T16:36:09+02:00

# Executive Summary

Input characteristics, confidence intervals, and recommended next steps.

<b>Input format</b>	HDF5
<b>Size</b>	300 channels x 4,000 samples @ 100 Hz
<b>Detected event centers</b>	24.77s, 35.45s
<b>Metric window source</b>	embedded_labels
<b>Signal/noise samples</b>	1,673 / 2,063
<b>Raw median power SNR</b>	5.88 dB (95% CI 5.64 to 6.29)
<b>HADRON median power SNR</b>	17.26 dB (95% CI 16.50 to 18.00)
<b>HADRON power SNR gain</b>	11.83 dB (95% CI 11.57 to 12.34)
<b>HADRON peak-to-RMS</b>	42.27 dB (95% CI 41.23 to 43.18)
<b>HADRON AUC</b>	1.00 (95% CI 1.00 to 1.00)

## Verdict

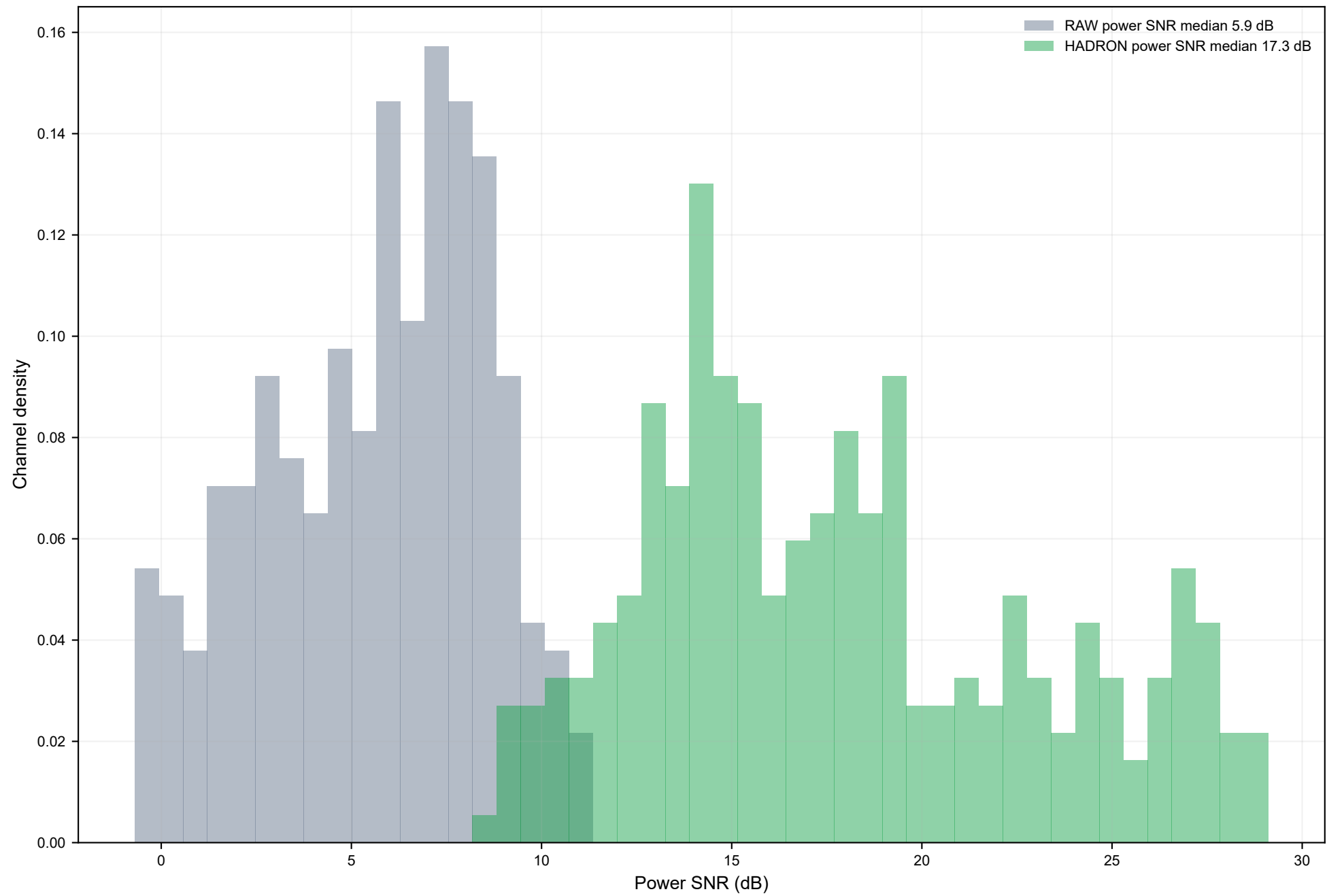
**STRONG: Strong enhancement with improved separability and preserved waveform morphology.**

## Recommended next steps

- Inspect the top event windows on channel CH0159; this channel had the largest measured SNR improvement.
- Treat the enhanced output as a review candidate and validate it with domain expertise before any further use.
- Commercial use, publication, redistribution, customer delivery, API use, implementation, or operational use requires written agreement with JAWD AS.

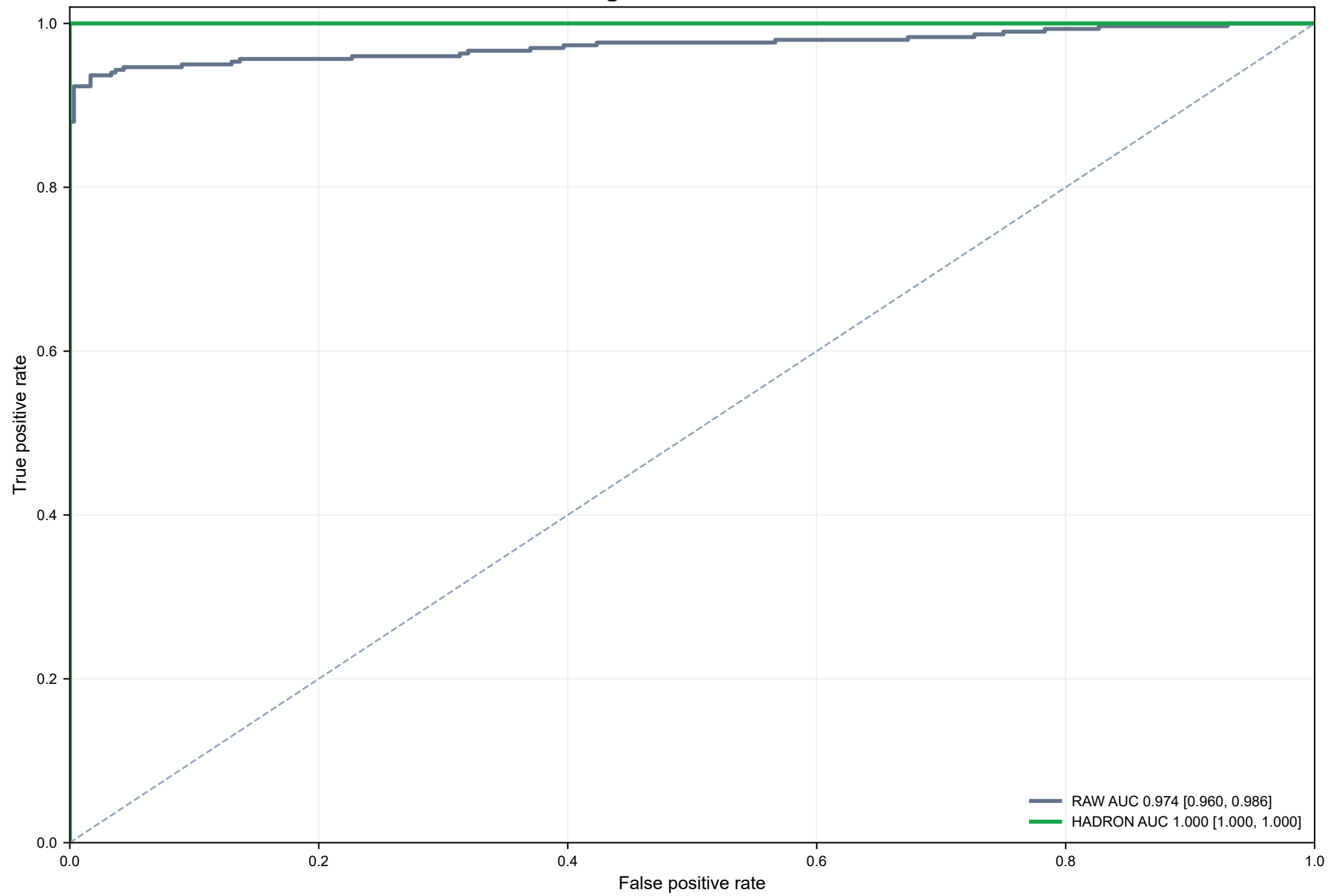
Scope note: these metrics are windowed signal-quality checks for this input and run. They are not independent event detection, location, full spatial seismological validation, or a warranty of operational suitability.

# Per-Channel Power SNR Distribution



What this means: a rightward shift means more channels have usable event energy above the measured quiet-period noise floor.

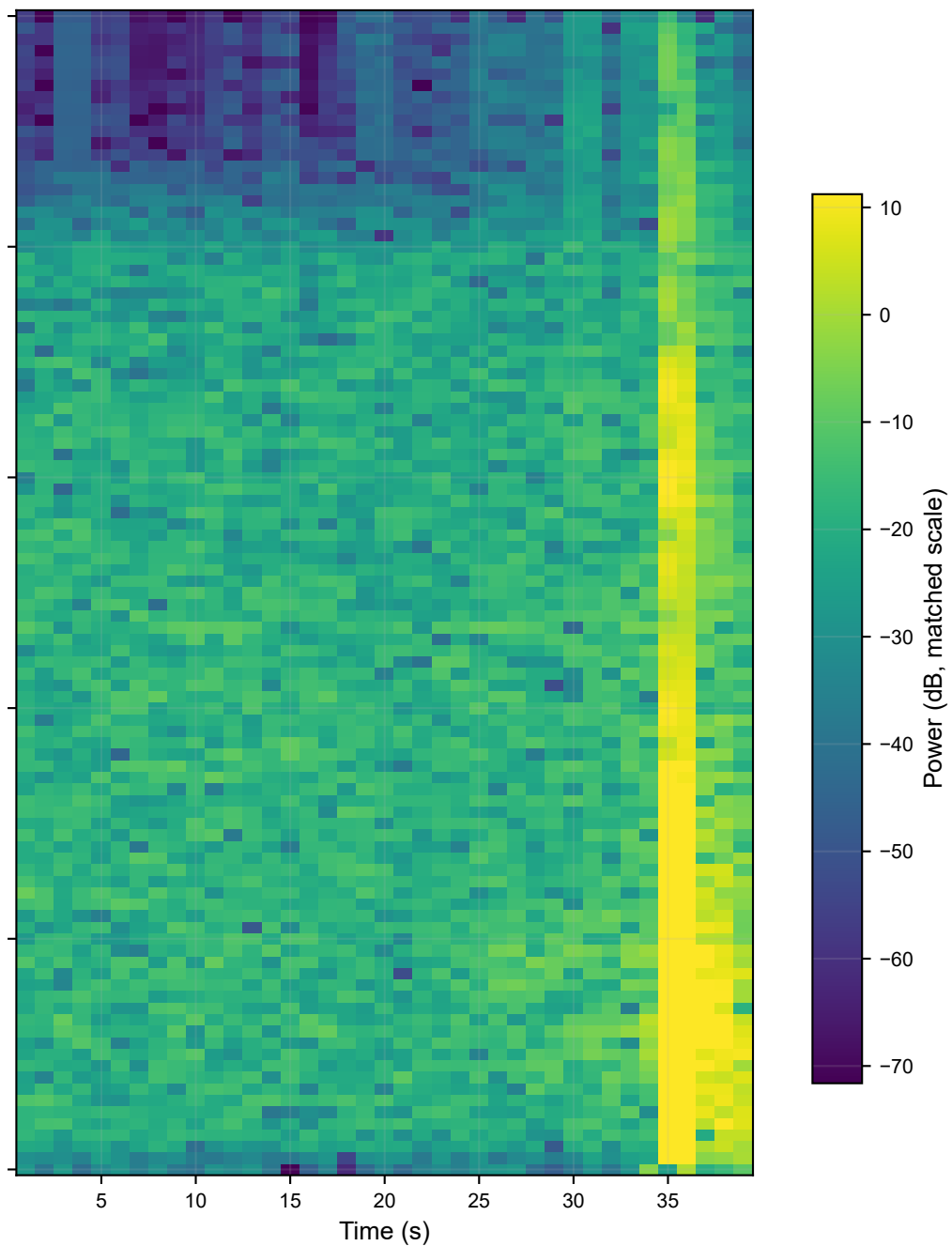
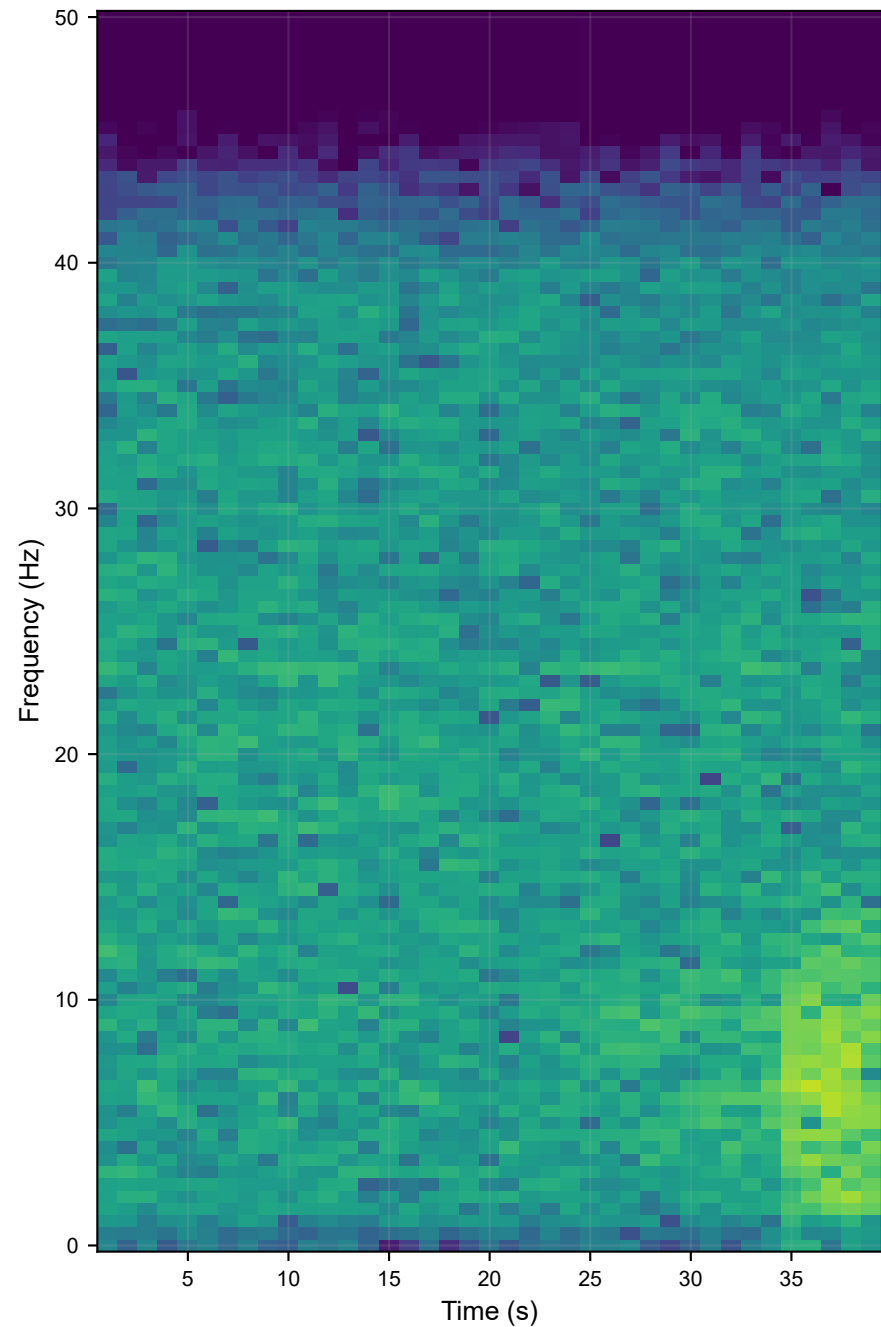
# ROC Curve: Signal-vs-Noise Discrimination



What this means: curves closer to the upper-left corner separate detected event windows from quiet windows more reliably.

Before HADRON - CH0159

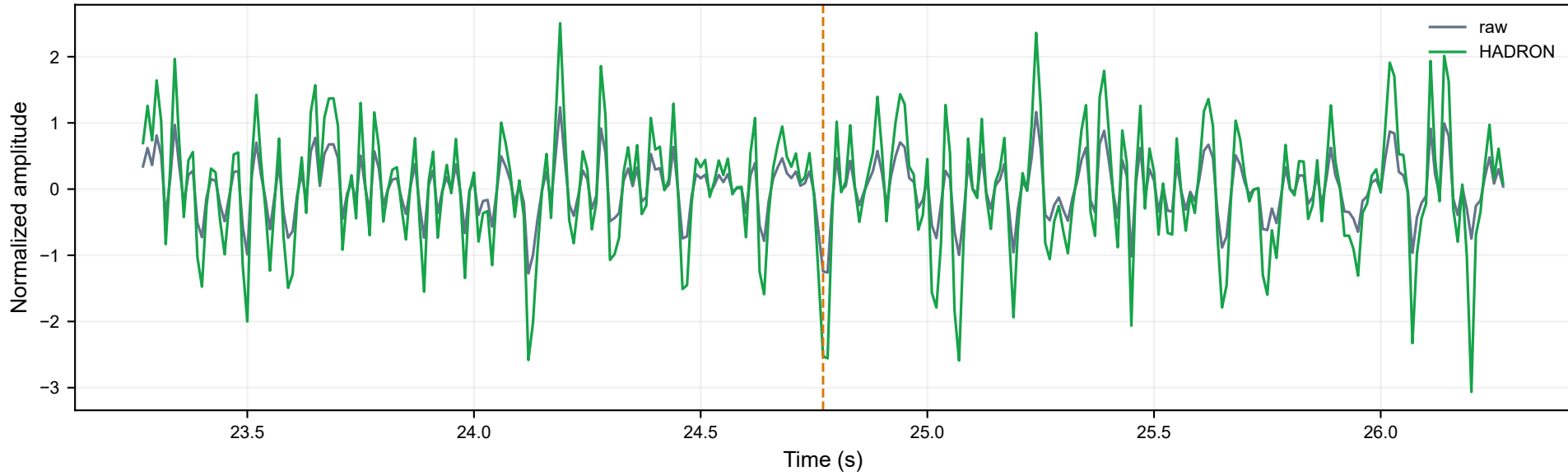
After HADRON



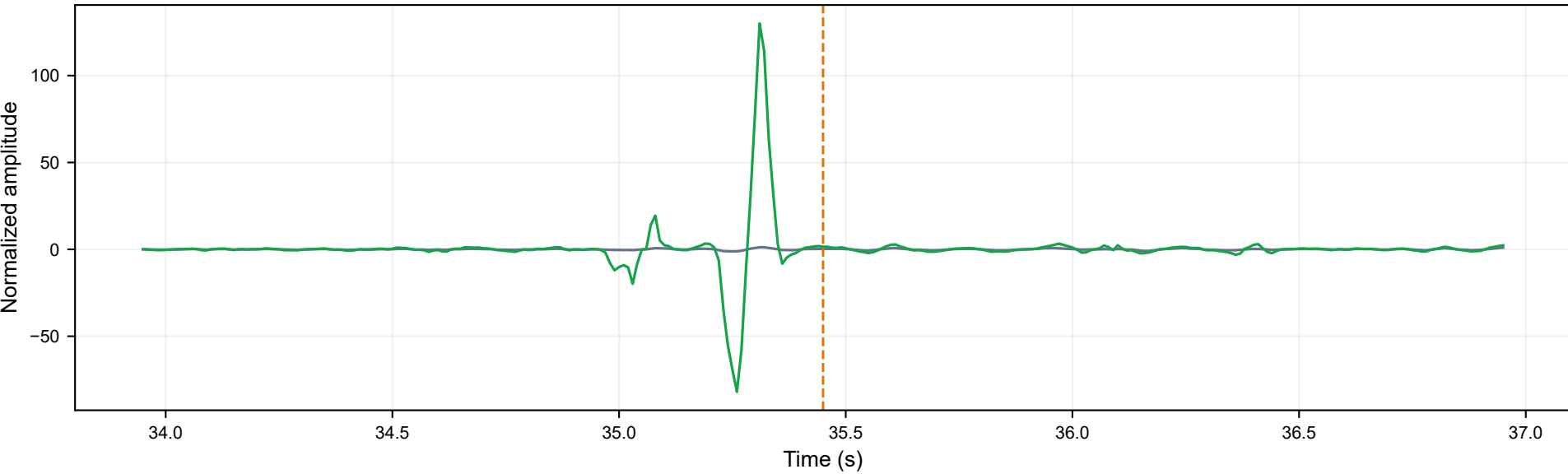
What this means: matched colorbars reveal where event energy improves without hiding broadband noise behavior.

# Time-Series Overlay - Best-Improved Channel CH0159

## 3-second event window centered at 24.77s

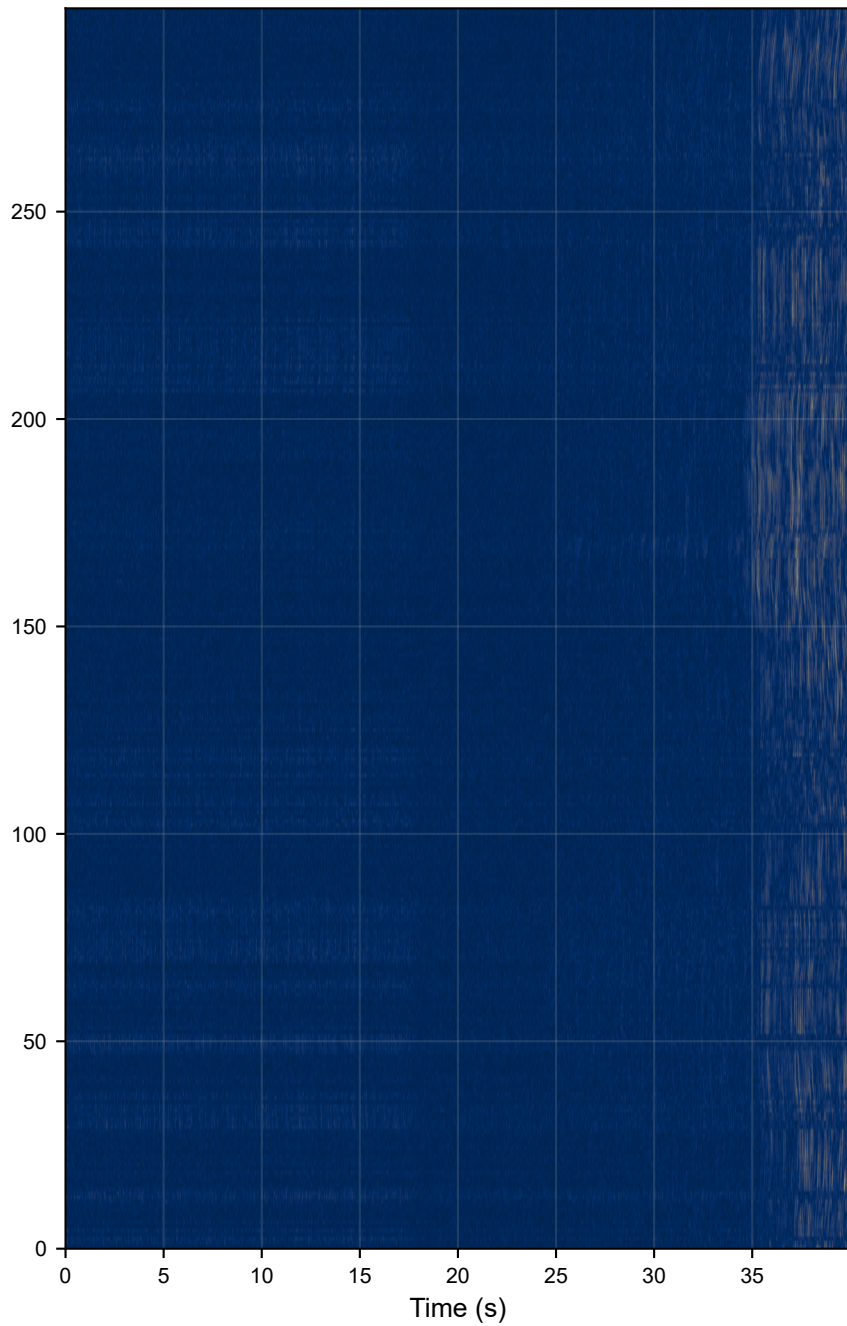


## 3-second event window centered at 35.45s

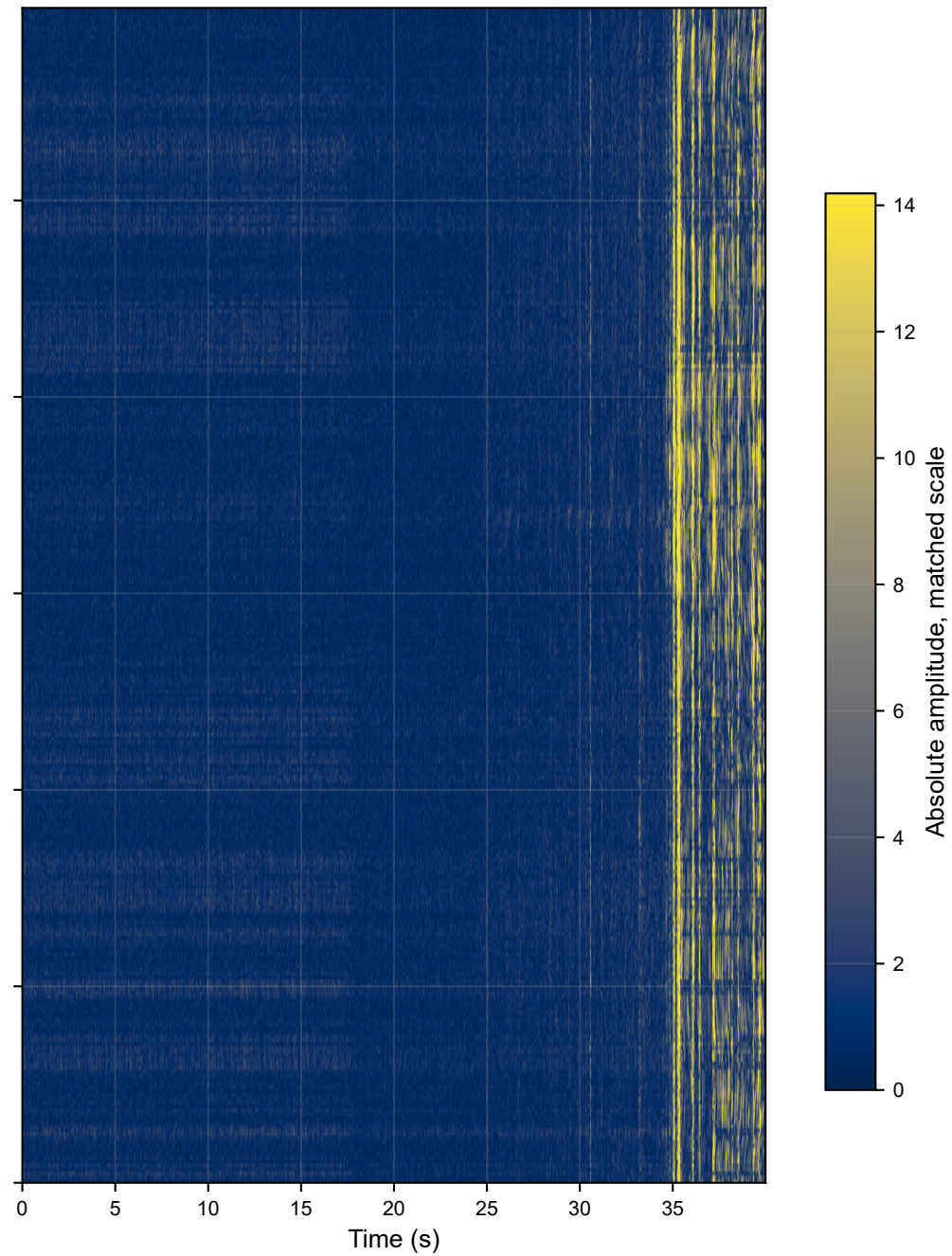


What this means: the enhanced trace should lift event arrivals while preserving waveform timing and morphology.

### Detection Map Before



### Detection Map After



Absolute amplitude, matched scale

14

12

10

8

6

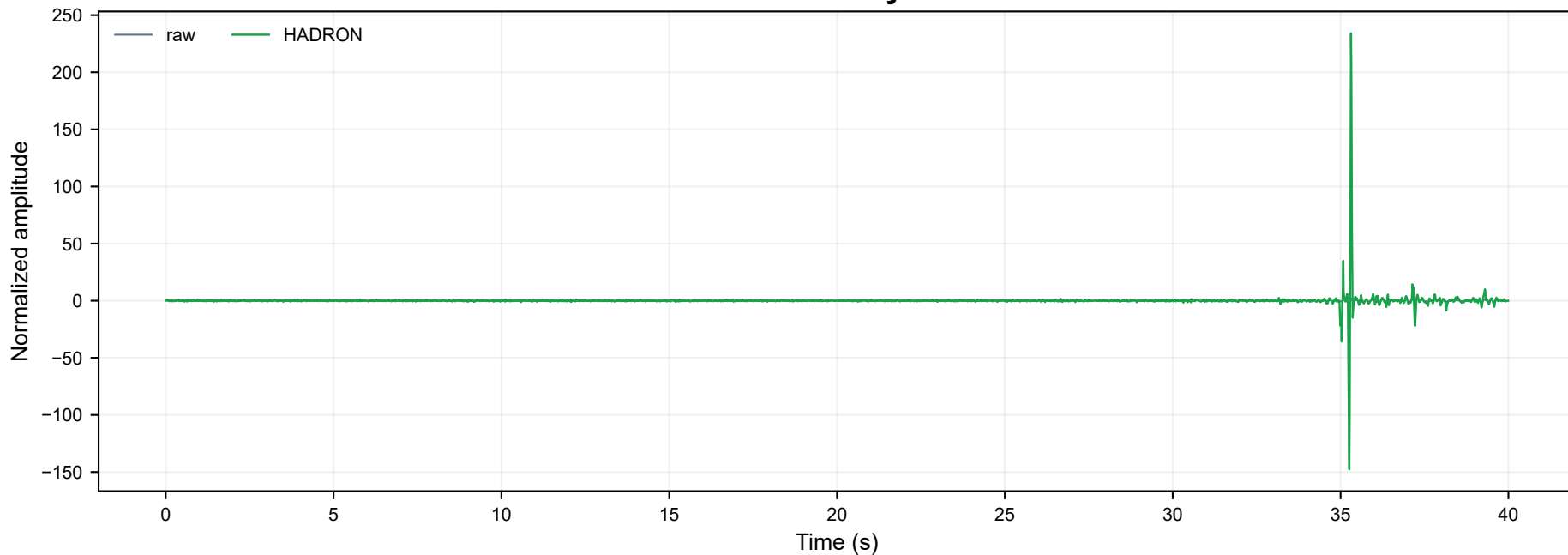
4

2

0

What this means: vertical or dipping event structures after HADRON are likely more pickable across channels.

# Waveform Overlay - CH0159



## Metric Comparison



What this means: the result is scored against the original input on signal/noise separation while keeping waveform timing intact.

# Data Appendix

<b>Input reference</b>	redacted by design
<b>Format detection</b>	HDF5
<b>Sample rate</b>	100 Hz
<b>Channels</b>	300
<b>Samples</b>	4,000
<b>Review notes</b>	none
<b>Quality warnings</b>	Channel geometry metadata was incomplete; some comparisons may be approximate.; Long-fiber timing review was used during quality evaluation.
<b>Event centers</b>	24.770s, 35.450s
<b>Metric scope</b>	Windowed signal-quality evaluation for this input/run; not full spatial seismological validation.

## What this means:

This appendix keeps the result auditable at the signal-quality level while avoiding source filenames, station identifiers, dataset paths, and proprietary processing details. The report is provided as-is for technology evaluation only and is not a warranty of suitability for any operational, safety-critical, commercial, or publication use.