



gPhoneXs registered the July 29, 2025 Kamchatka Earthquake

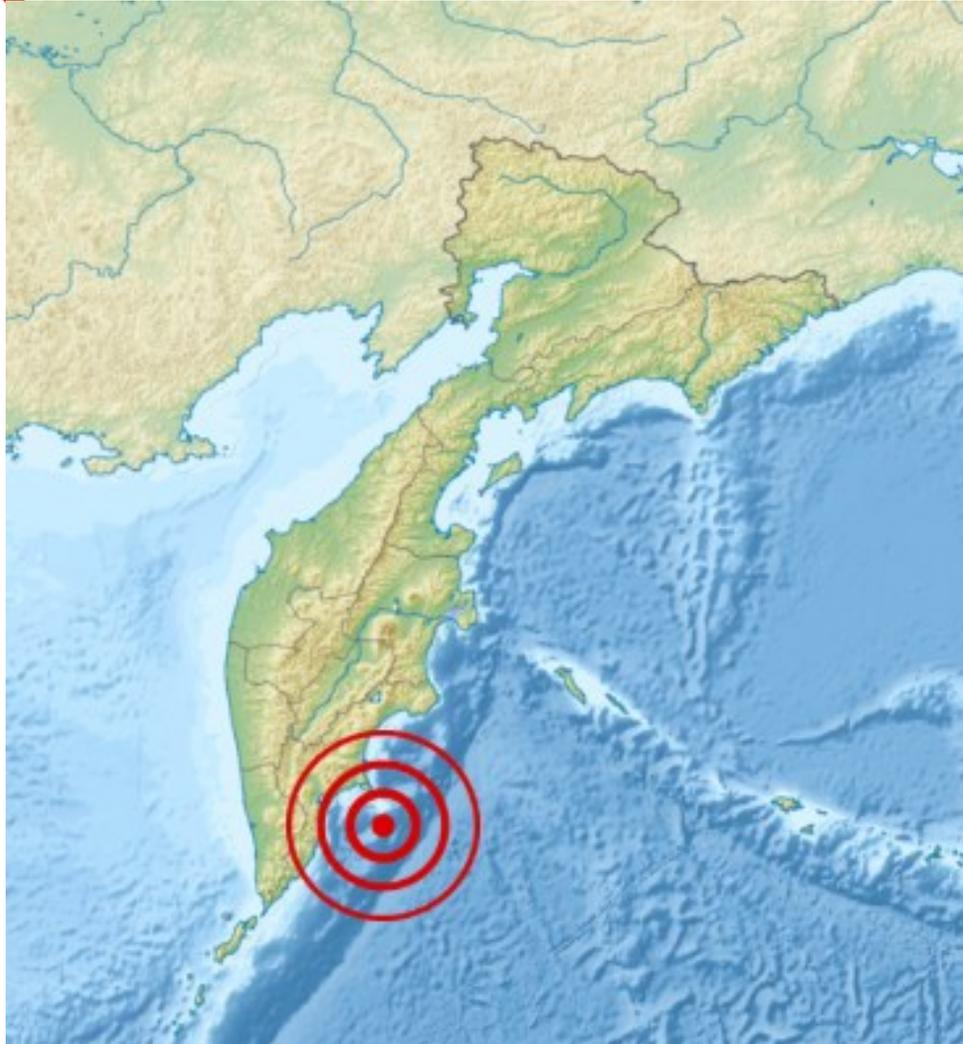
2025-08-19



Summary

- A magnitude 8.8 mw earthquake occurred on July 29, 2025 at UTC 23:24:52 (details see next slide)
- Six gPhoneXs at three locations registered the earthquake:
 - 1 from NOAA in Alaska (AK)
 - 1 from NOAA at Table Mount Gravity Observatory (TMGO), Colorado
 - 4 at Microg LaCoste (MGL), Colorado.

2025 Kamchatka earthquake



UTC time **2025-07-29 23:24:52**

ISC event 643826916

USGS-ANSS ComCat

Local date 30 July 2025

Local time 11:24:52 PETT (UTC+12)

Duration 4 minutes

Magnitude Mw 8.8

Depth 35 km (12.9 mi)

Epicenter 52.473°N 160.396°E

Fault Kuril–Kamchatka Trench

Type Megathrust

Areas affected Kamchatka Peninsula, Russia

Max. intensity MMI VIII (Violent)

Tsunami 19 m (62 ft)

Foreshocks 399 > Mw 4.0, Mw 7.4 on 20 July 2025

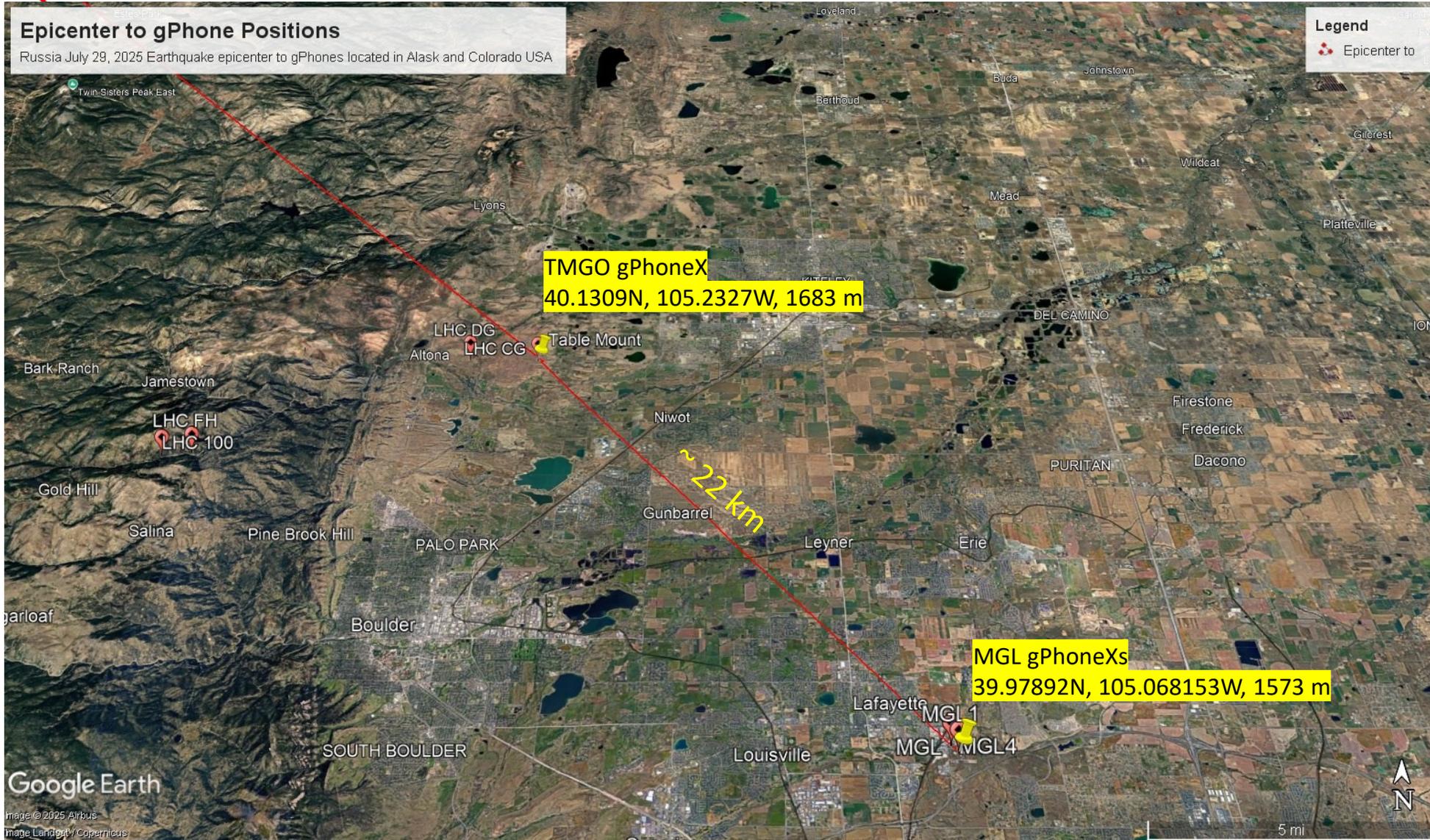
Aftershocks 927+>Mw 4.0 Mw 6.9 on 30 July 2025

Casualties 1 death (indirect), 25 injuries (21 indirect)

Map distance from epicenter to gPhoneXs in Alaska and at TMGO, Colorado



Map distance From TMGO to MGL, Colorado

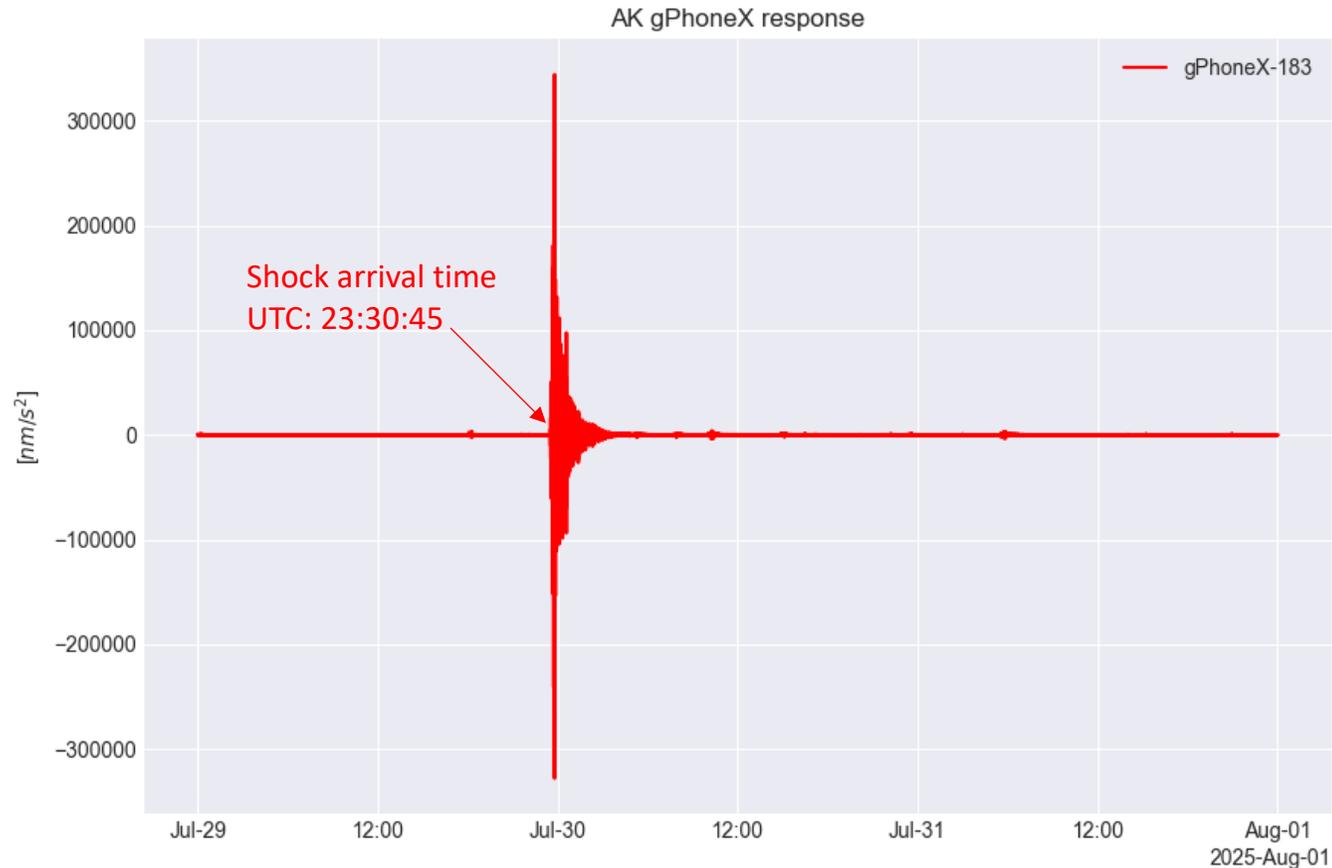




The vector distances

- Vector distances are computed from the XYZ coordinates of the epicenter and the gPhoneX locations at AK, TMGO and MGL
 - From epicenter to AK gPhoneX: 3105.0 km
 - From epicenter to TMGO gPhoneX: 6542.9 km
 - From epicenter to MGL gPhoneXs: 6561.7 km
- Vector distances are used to estimate travel time of P-waves

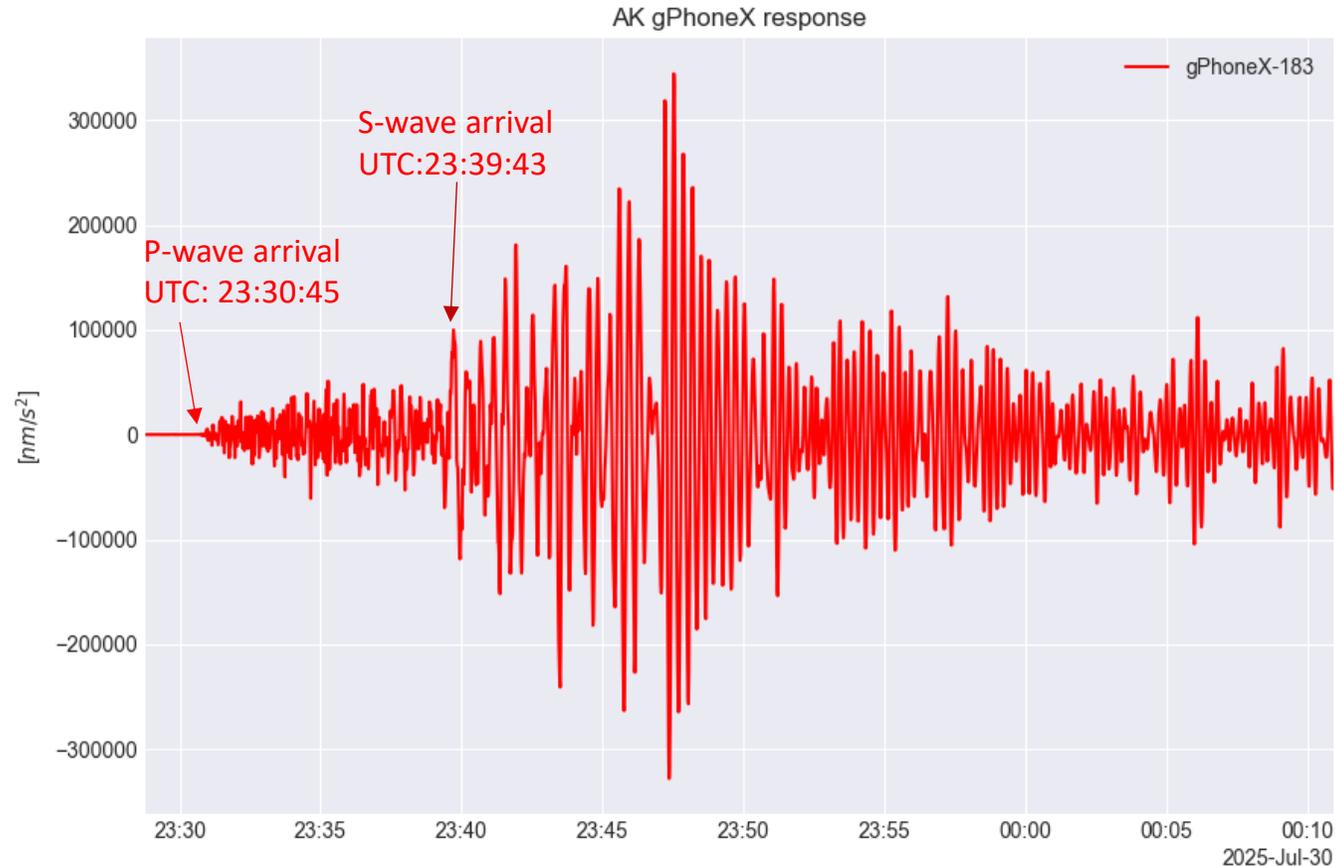
AK gPhoneX response to the earthquake



Vector distance: 3105km
P-wave nominal speed: 8 km/s
Estimated time from the epicenter to AK gPhoneX: 6 min 28 second; 5 min 53 second per gPhoneX, indicating the shock from this earthquake travels faster than the nominal speed.

Mainshock (USGS: [2025-07-29 23:24:52](#))

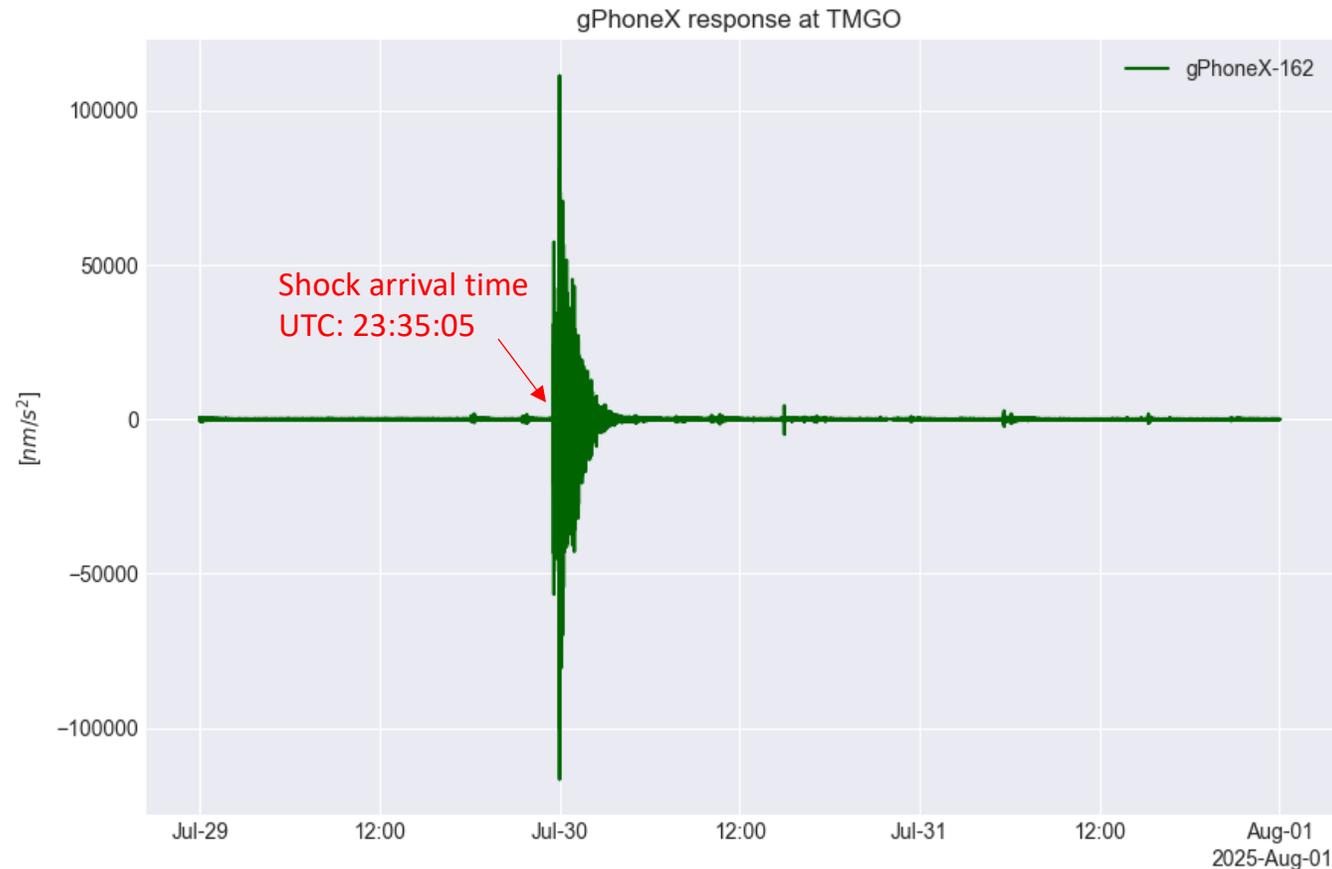
AK gPhoneX P-wave and S-wave signals



- Map distance: 3137 km
- S-wave nominal speed: 3.5 km/s
- Estimated time from the epicenter to AK gPhoneX: 14 min 56 second; 14 min 51 second per gPhoneX, slightly faster than predicted

Mainshock (USGS: [2025-07-29 23:24:52](#))

TMGO gPhoneX* registered the shock about 5 min after the AK gPhoneX

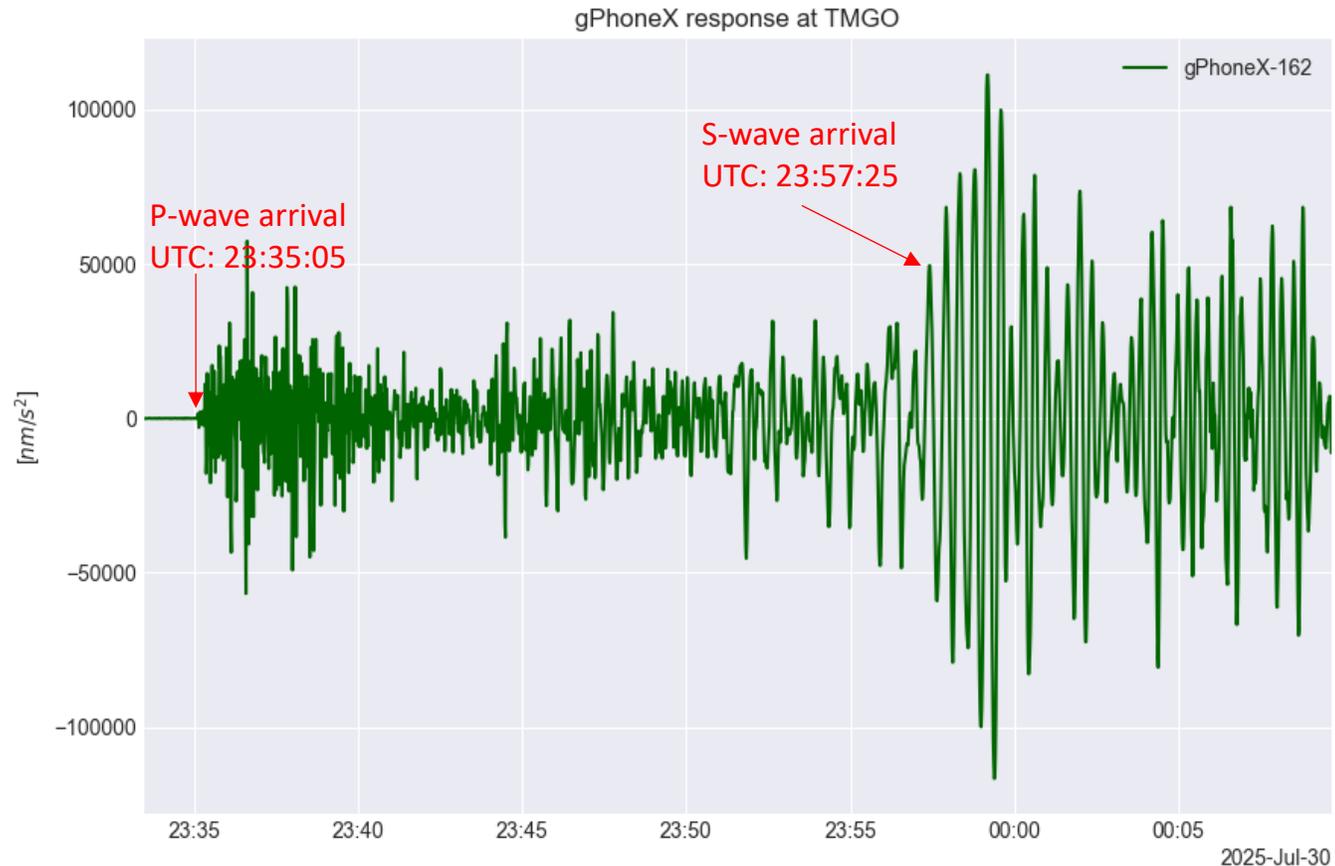


- Vector distance: 6543km
- P-wave nominal speed: 8 km/s
- Estimated time from the epicenter to table Mount gPhoneX: 13 min 38 second; 10 min 13 second per gPhoneX, also indicating the p-wave travels faster than the nominal speed.

Mainshock (USGS: [2025-07-29 23:24:52](#))

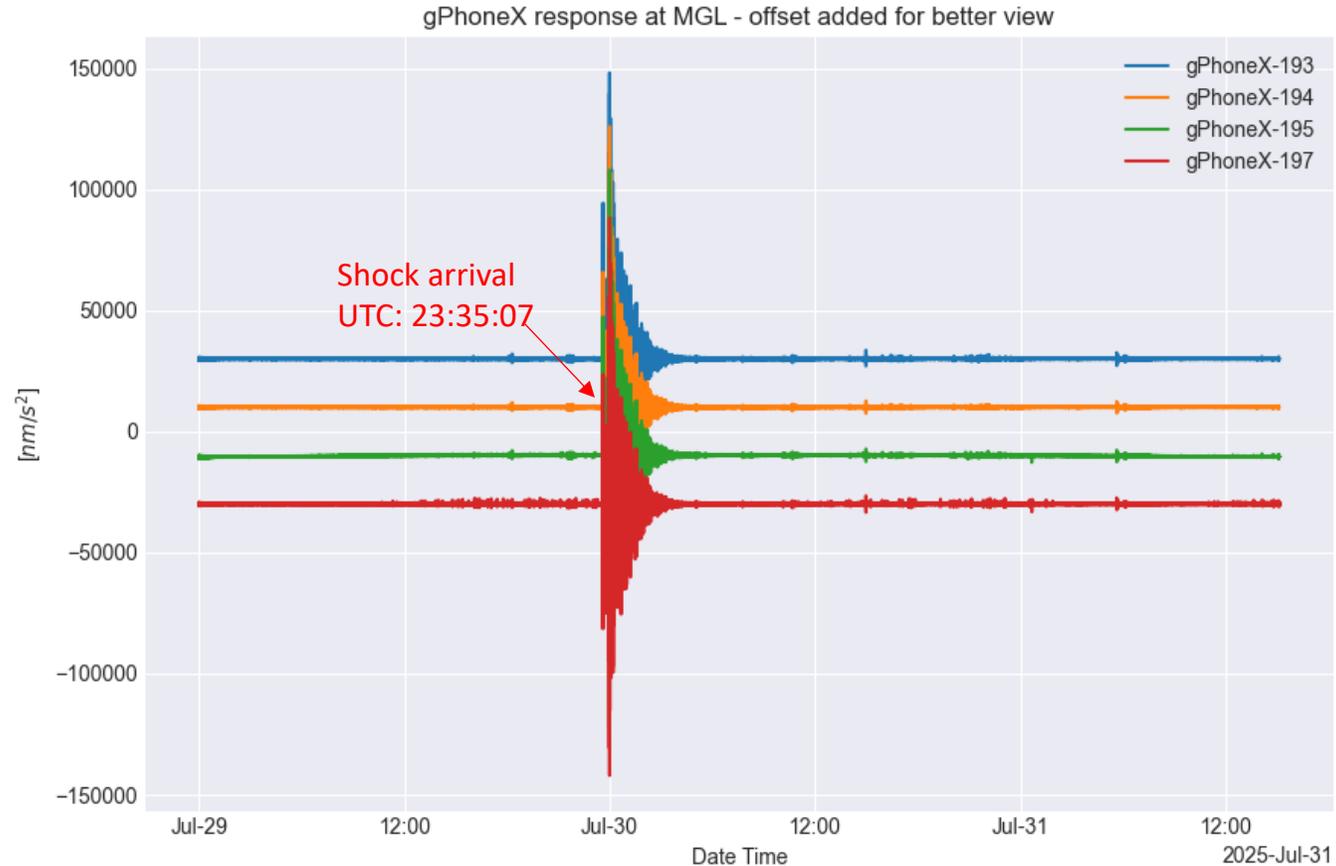
* gPhoneX-162 time adjusted roughly referenced to gPhoneX 193 at MGL

TMGO gPhoneX P-wave and S-wave signals



- Map distance: 6868 km
- S-wave nominal speed: 3.5 km/s
- Estimated time from the epicenter to Table Mount gPhoneX: 32 min 42.3 second; 32 min 33 second per gPhoneX, indicating faster speed than nominal Mainshock (USGS: 2025-07-29 23:24:52)

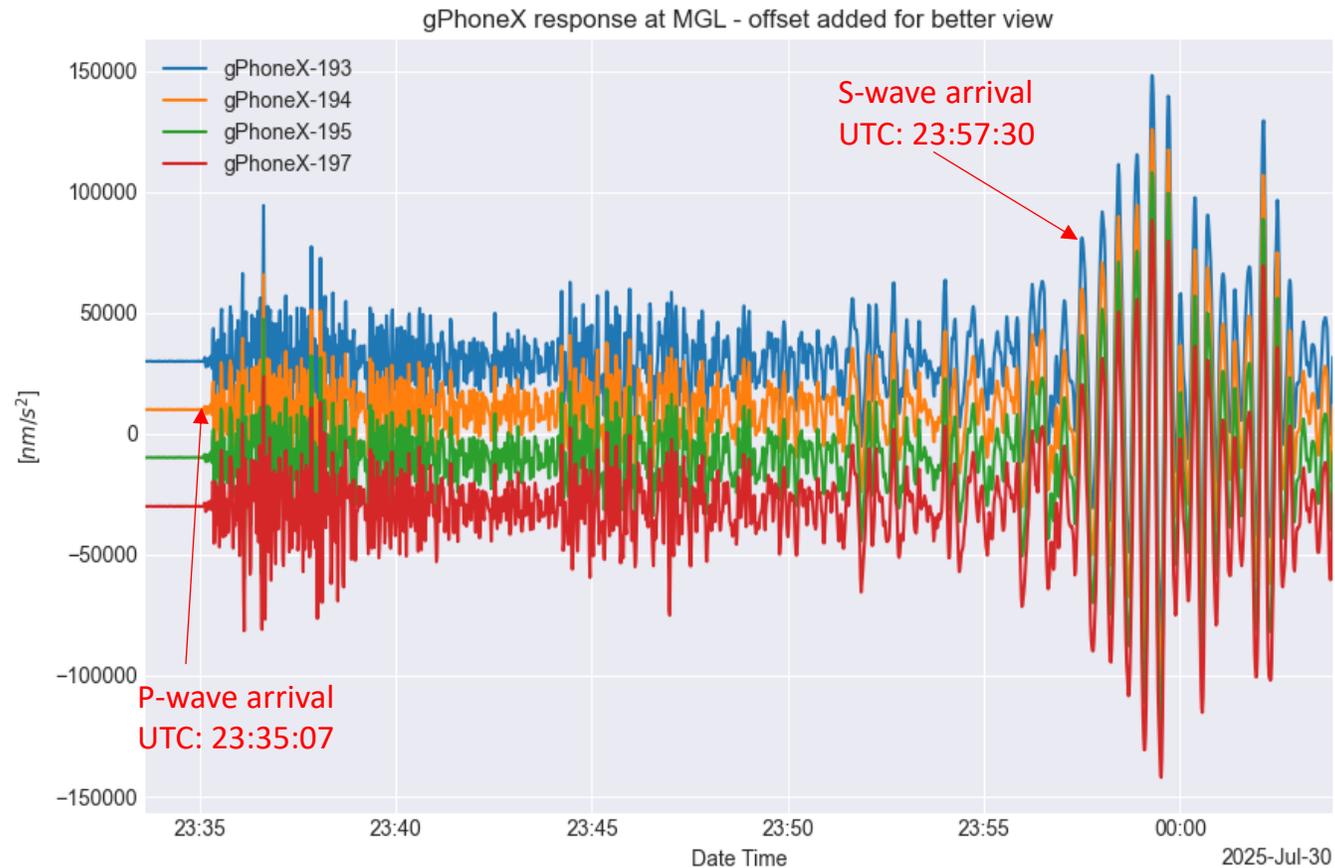
gPhoneXs at MGL response to the shock



- Vector distance: 6562km
- P-wave nominal speed: 8 km/s
- Estimated time from the epicenter to MGL: 13 min 40 second; 10 min 15 second per gPhoneXs, indicating the p-wave travels faster than the nominal speed.

Mainshock (USGS: **2025-07-29 23:24:52**)

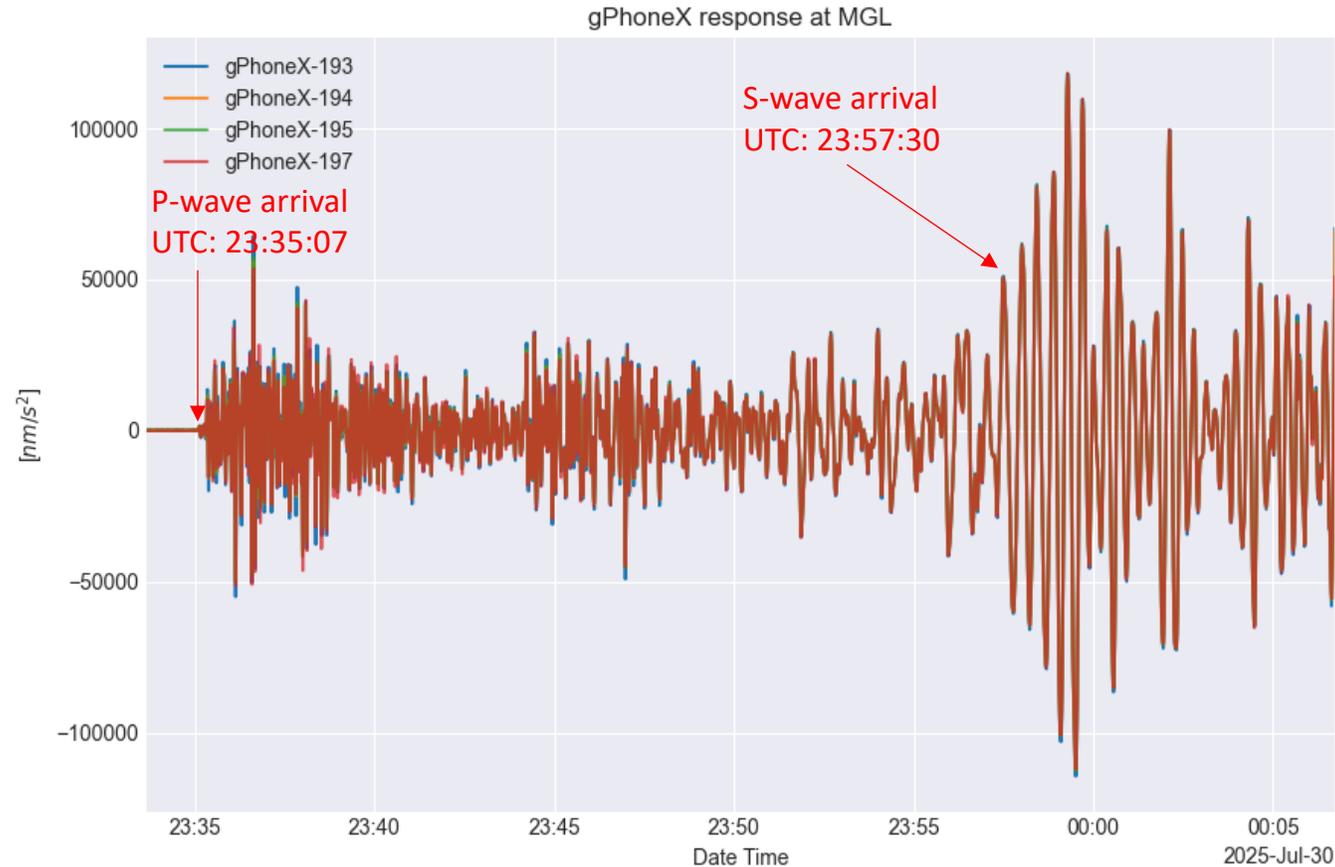
MGL gPhoneXs P-wave and S-wave signals



- Surface distance: 6888 km
- S-wave nominal speed: 3.5 km/s
- Very rough Estimated time from the epicenter to MGL: 32 min 48 second; 32 min 40 s per gPhoneXs

Mainshock (USGS: [2025-07-29 23:24:52](#))

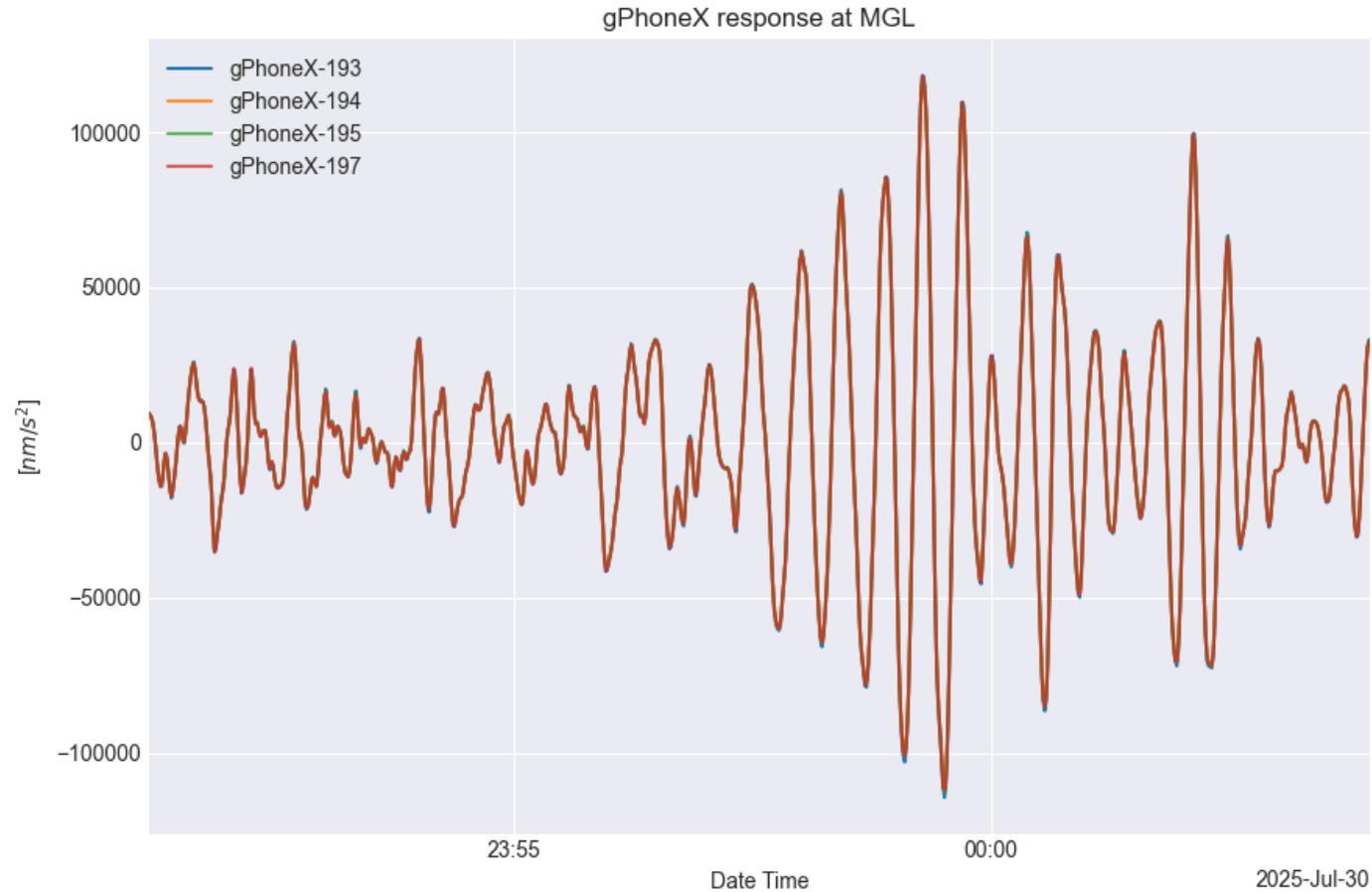
MGL gPhoneXs P-wave and S-wave signals (stacked without offset)



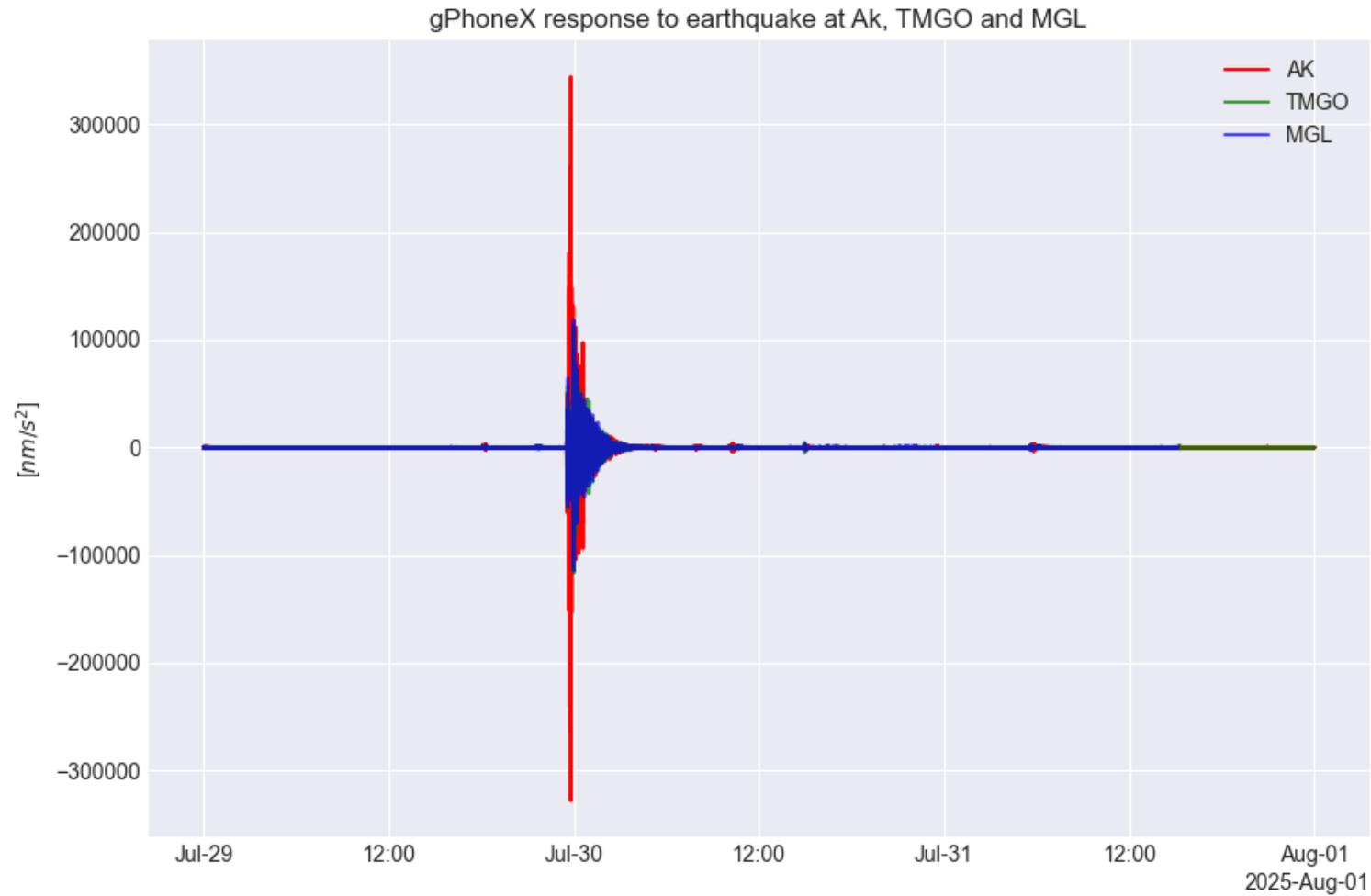
- Surface distance: 6888 km
- S-wave nominal speed: 3.5 km/s
- Very rough Estimated time from the epicenter to MGL: 32 min 48 second; 32 min 40 s per gPhoneXs

Mainshock (USGS: [2025-07-29 23:24:52](#))

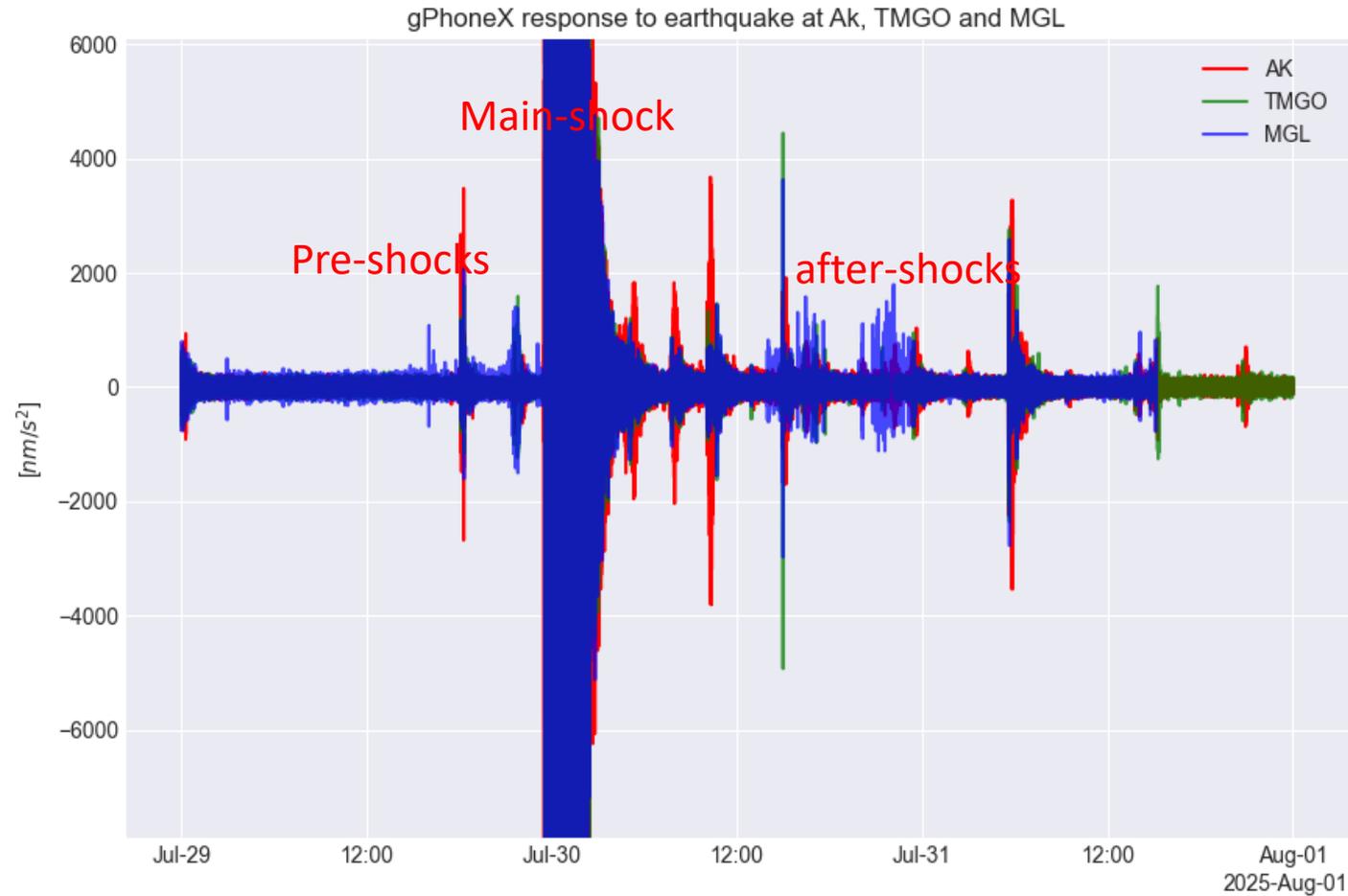
Without offset Four gPhoneXs at MGL responded with virtually the same waveform and magnitude to the earthquake



gPhoneX responses at AK, TMGO and MGL

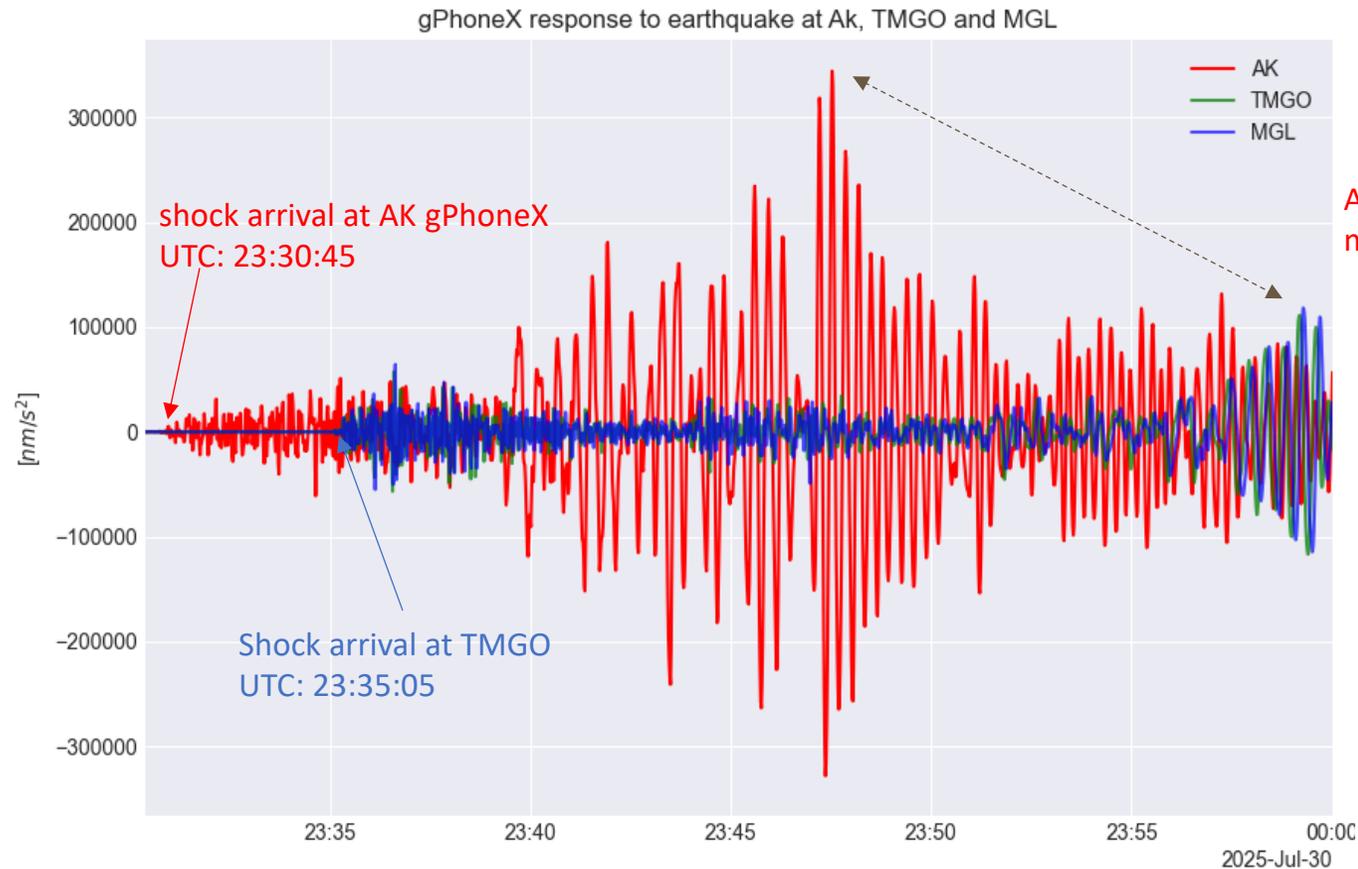


gPhoneXs at AK, TMGO and MGL registered also pre-shocks and after shocks





Arrivals and magnitudes registered by gPhoneXs at three locations



AK gPhoneX register S-wave 3 times the magnitude that gPhoneXs at TMGO and MGL



conclusion

- gPhoneXs at Alaska, TMGO and MGL registered the Kamchatka earthquake occurred on 29 July 2025 at UTC 23:24:52
- The arrival times reaches the gPhoneXs earlier than the predicted times using nominal speed, indicating the shock from this earthquake propagates faster than nominal.
- gPhoneX at Alaska registers 3 times higher magnitude signals than those at TMGO and MGL
- gPhoneXs at MGL registers the earthquake with the same amplitude as well as waveforms, indicating consistency between the meters as well as individual integrity.



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