Possibility of Huge Earthquake Prediction by 5 Methods

Seismic Resilient Structures Conference
2025/11/5
NPO JEPCOC Chief Engineer
Yoshuharu Saito

1. Sensitive Phenomenon for EQ Precursor

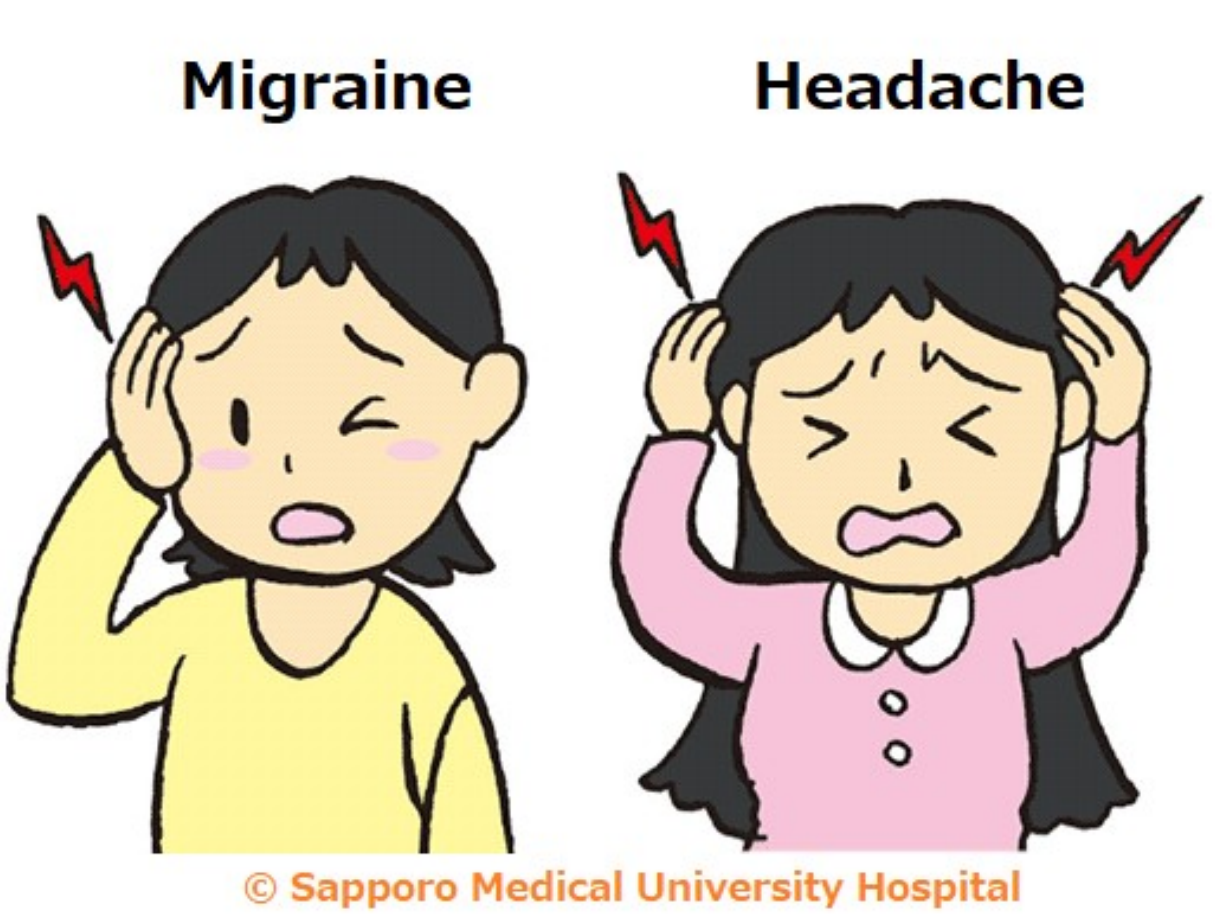
1) Human

Headache,

Tinnitus, Dizziness,

Back Pain etc.

Data collection is difficult



1. Sensitive Phenomenon for EQ Precursor

2) Animals





- **make noise, act violently**

  Dairy Cow(Changes in milk production), etc.
- **Data collection is difficult**
- **Humans and animals may feel seismic electromagnetic fields**

1. Sensitive Phenomenon for EQ Precursor

2) Animal: Earthworms, Frogs

Alignment to one direction of earthworm before Taiwan Chi-Chi EQ M=7.6 1999/09/21
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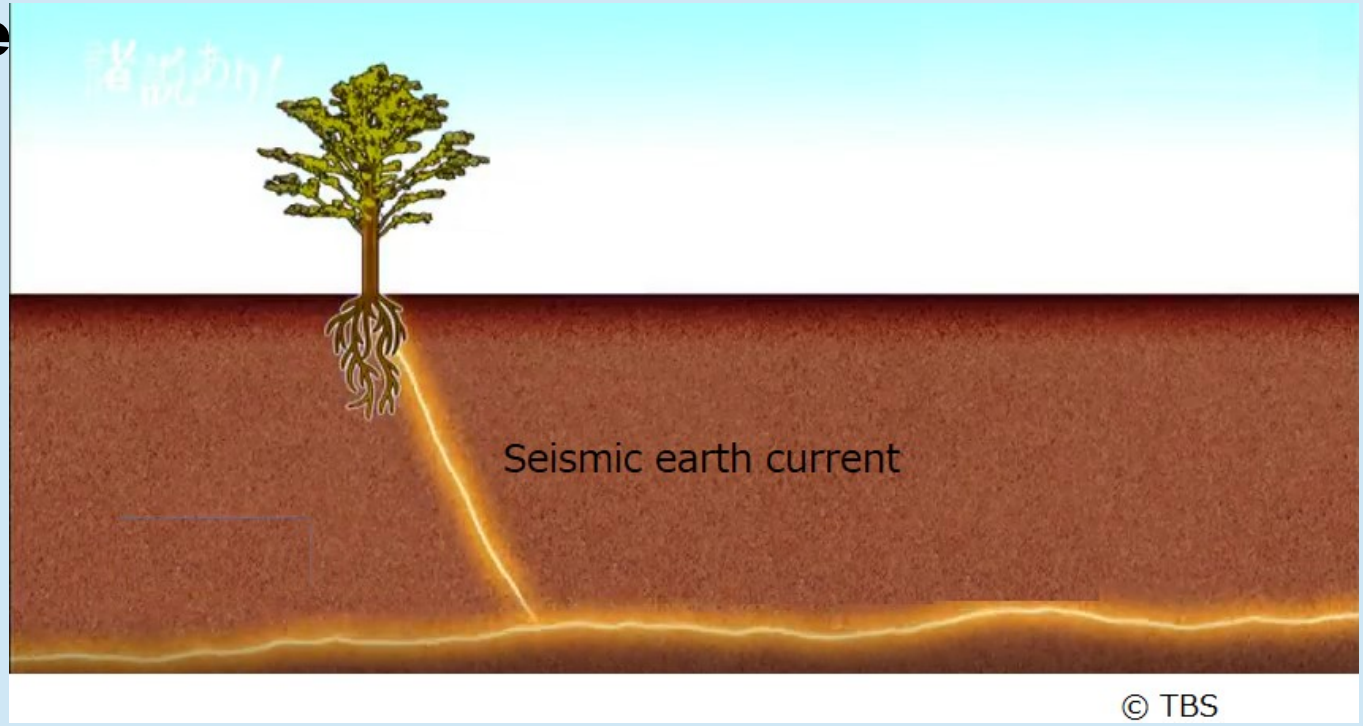
Plenty of frogs appeared on the road 2 days before a China EQ
© NPO e-PISCO

1. Sensitive Phenomenon for EQ Precursor

3) Plant, Tree(Bio Electric Potential)

Easy to observe



2. Effective observation methods

1) Crustal Movement (Tokai University)

2) Ionospheric Disturbance (Our NPO)

3) Electromagnetic wave at adjacent dual frequency Observation at several frequency bands (Our NPO)

4) Tree Bio electric Potential (Our NPO)

5) Total Electron Content of ionosphere (Kyoto University)

3. Preceding Time

Method \ Preceding	6 Month	1 Month	1 Week	1 Day	10 Hours	1 Hour	30 Sec	1 Minute
Crustal Movement (All over Japan)	⟷	⟷						
Ionospheric Disturbance (within 1000km)			⟷	⟷				
Electromagnetic wave (within 50km)			⟷	⟷				
Tree Bio electric Potential (within 500km)					⟷	⟷		
TEC Obs. From Satellite (All over Japan)							⟷	⟷

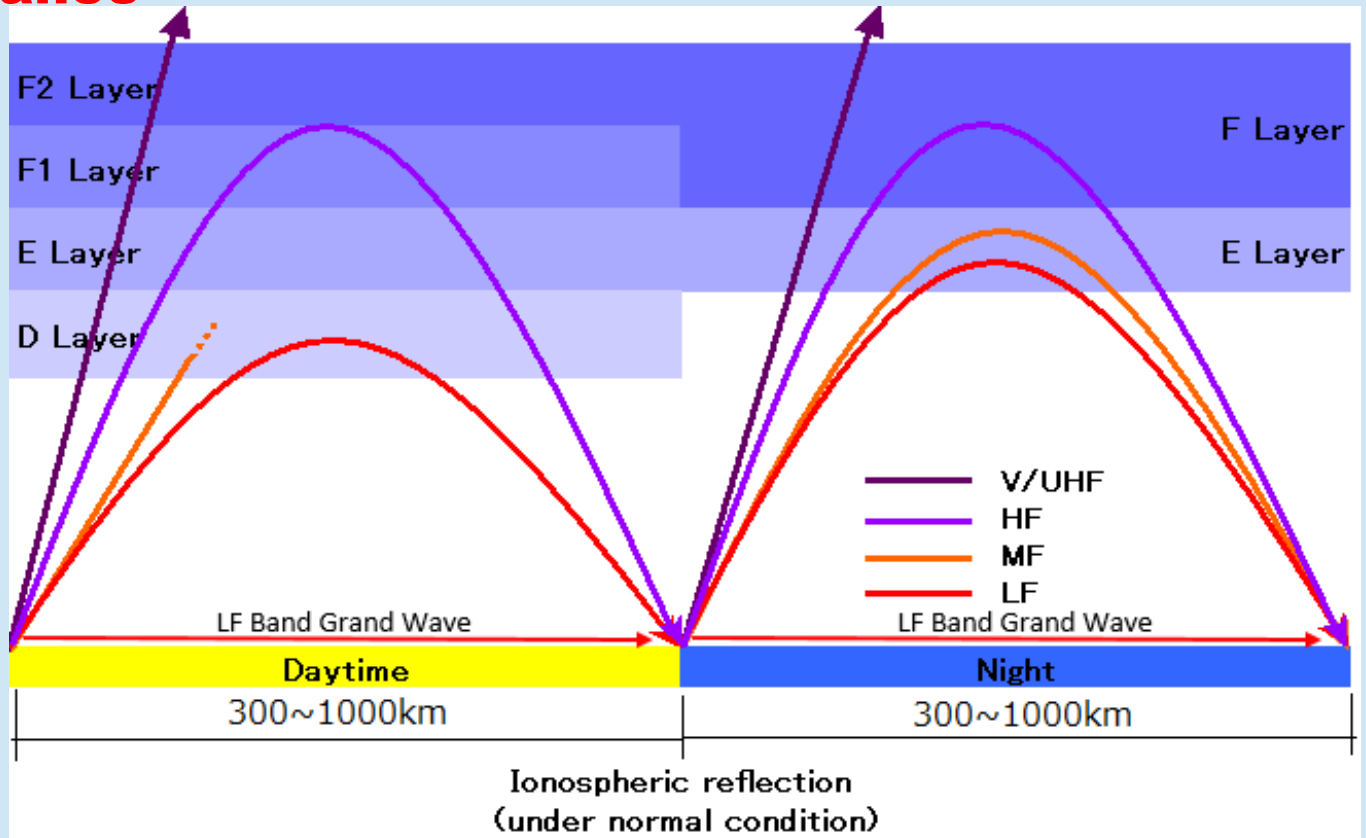
TEC:Total Electron Content of ionosphere

4. Observation Posts

5. Description of each method

2) Ionospheric Disturbance

- Utilize the fact that distant AM broadcast waves can be received at night but not during the day



Source: https://commons.wikimedia.org/w/index.php?curid=

5. Description of each method

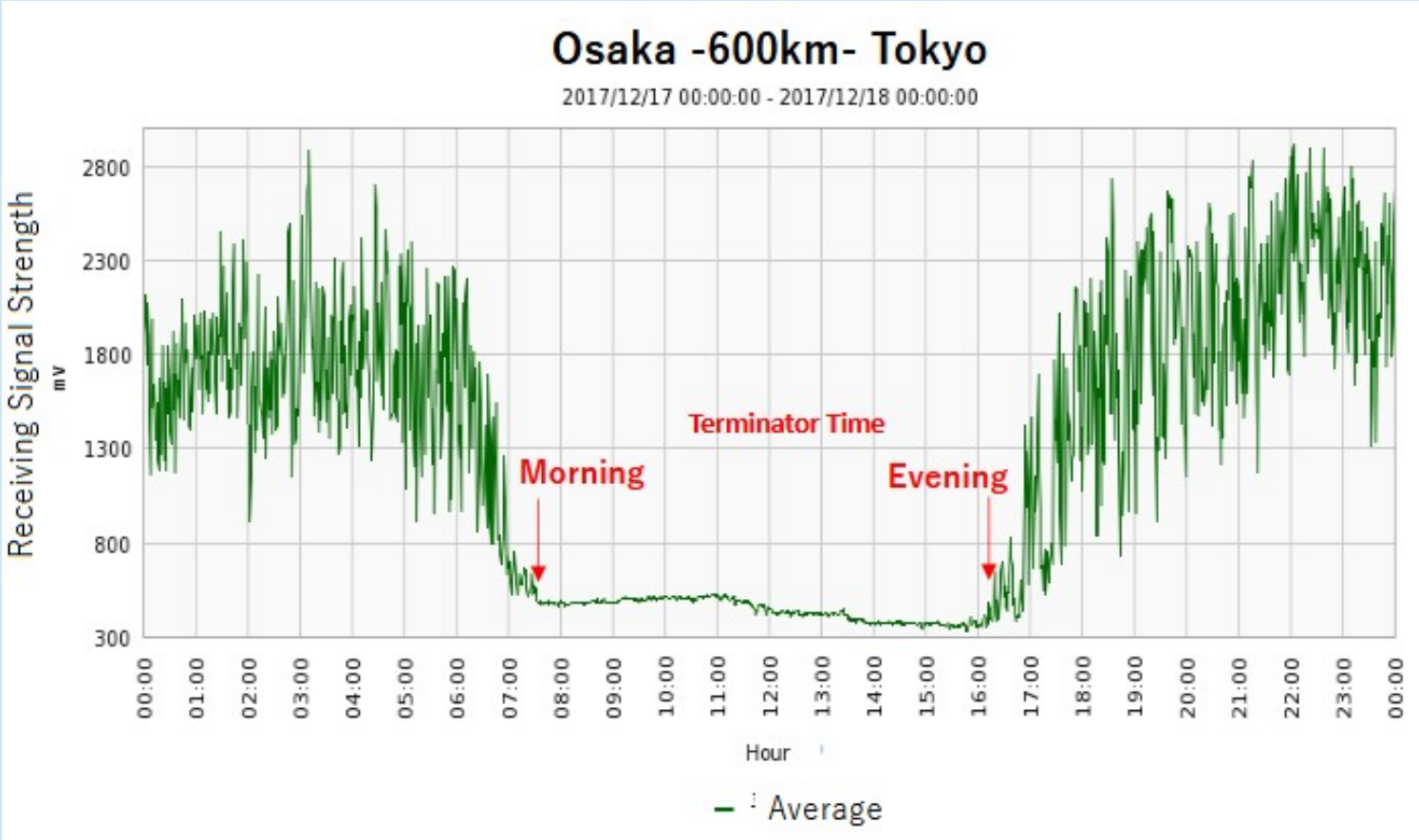
2) Ionospheric Disturbance

- AM Transmission Broadcasting Stations

5. Description of each method

2) Ionospheric Disturbance

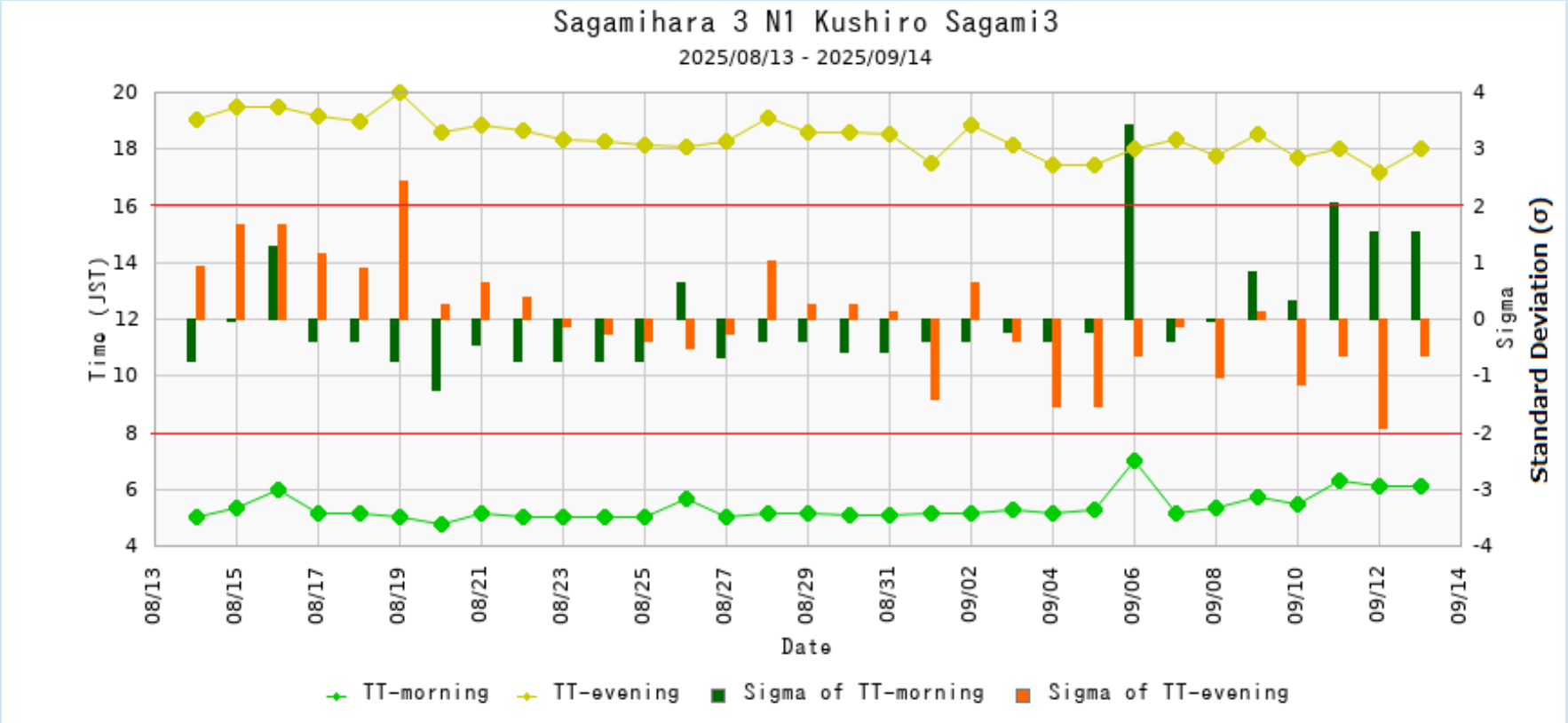
- Actual Receiving raw data



5. Description of each method

2) Ionospheric Disturbance

- Analysis Data

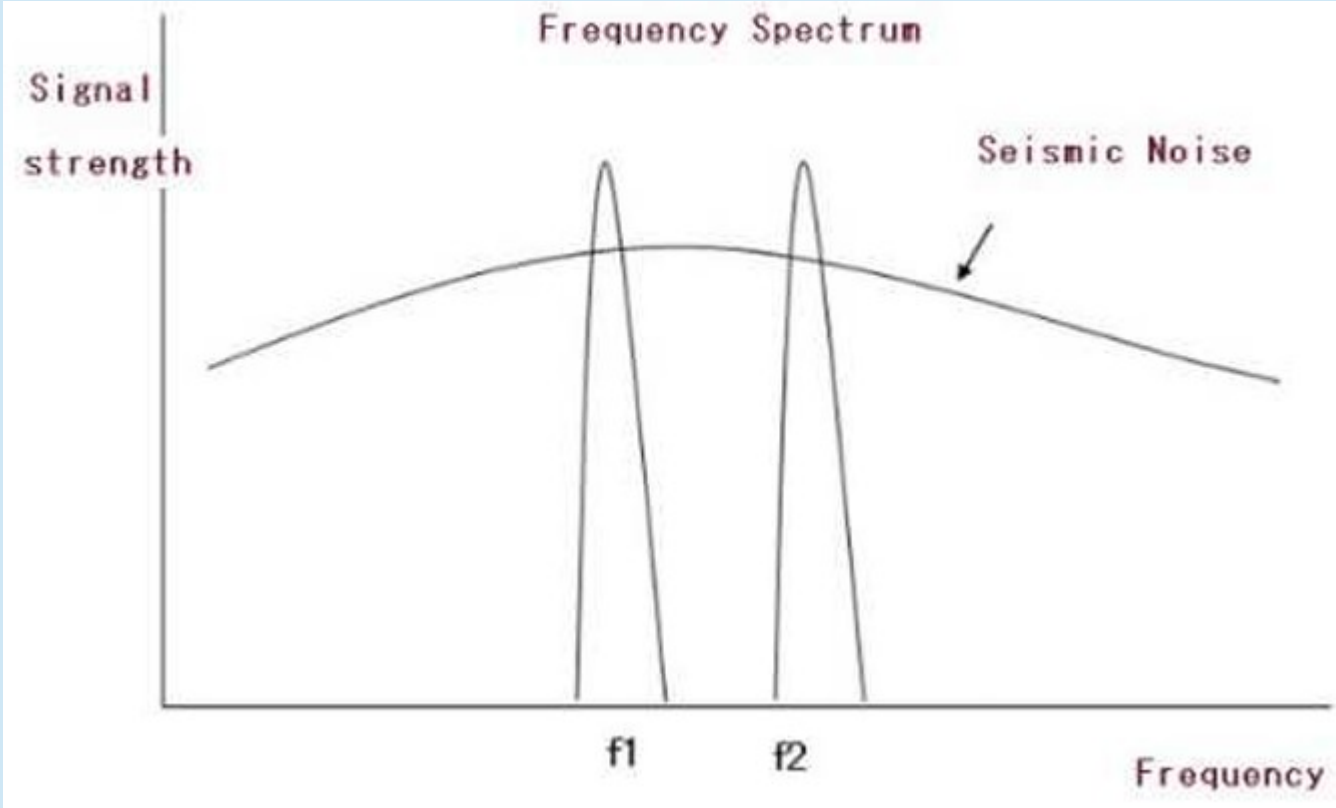


5. Description of each method

3) Electromagnetic wave at adjacent dual frequency Observation at several frequency bands

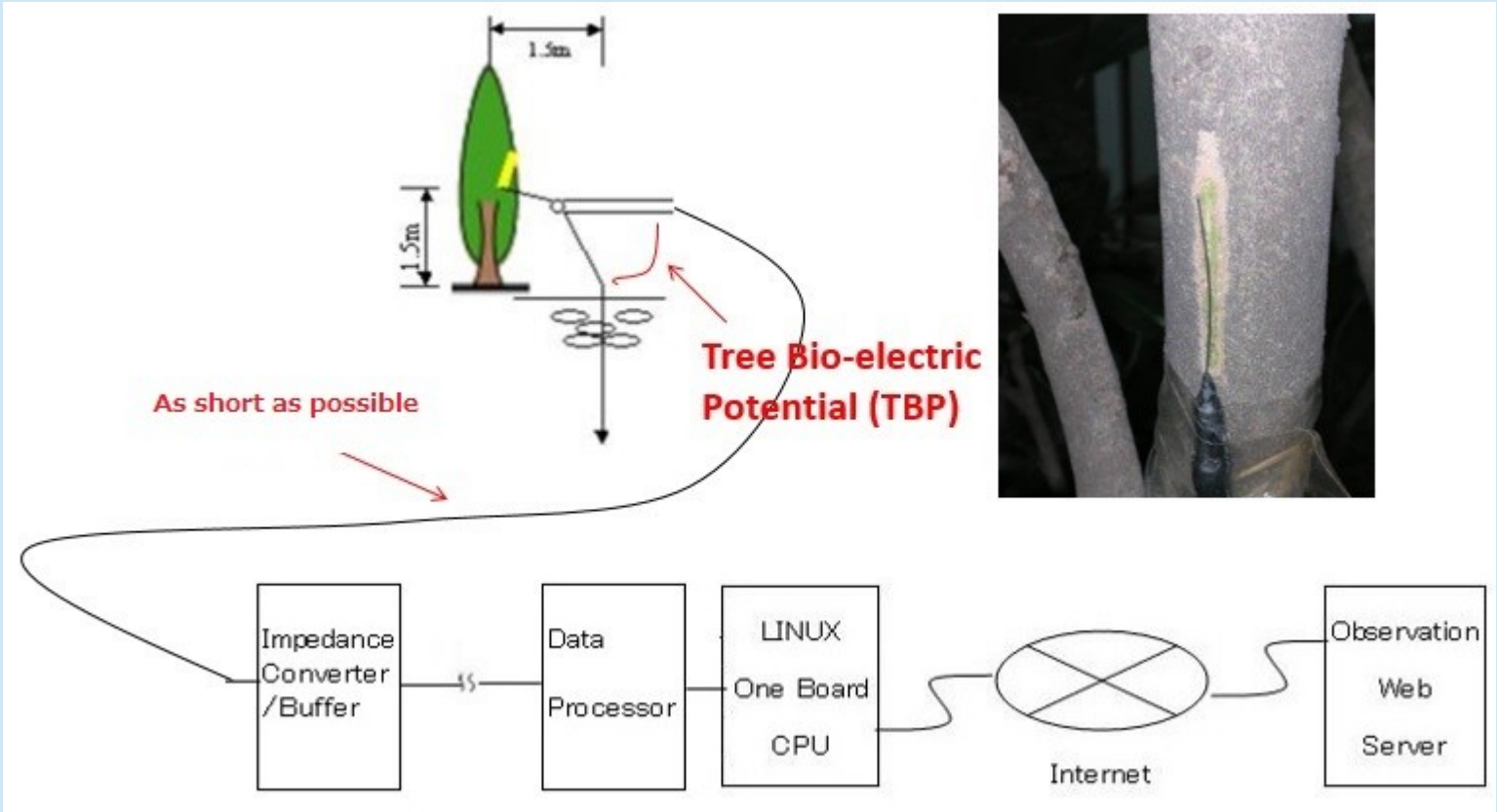
- VLF(100kHz), MF(500kHz), VHF(76MHz), UHF(400MHz)

- When noise is observed simultaneously at two frequencies, judged to be Seismic



5. Description of each method

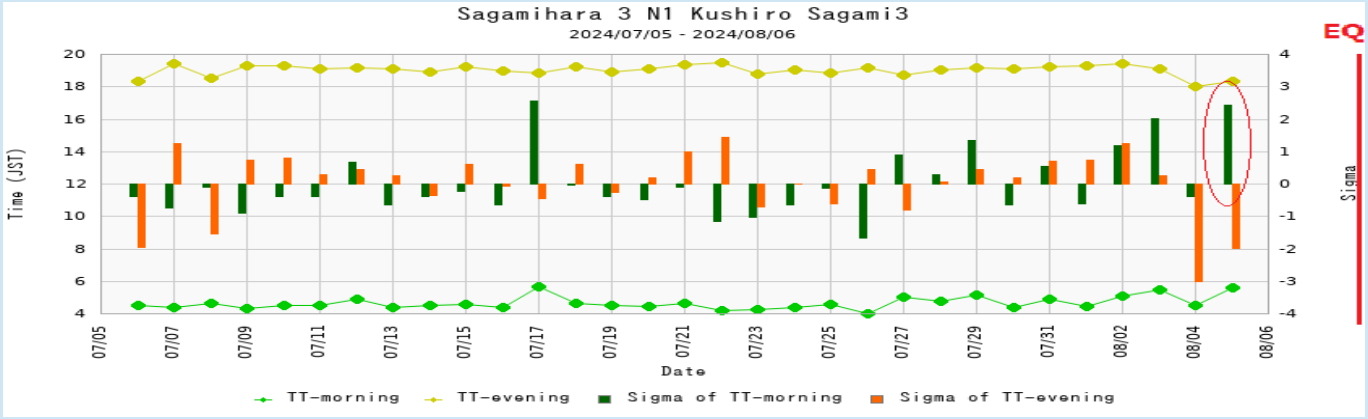
4) Tree Bio electric Potential



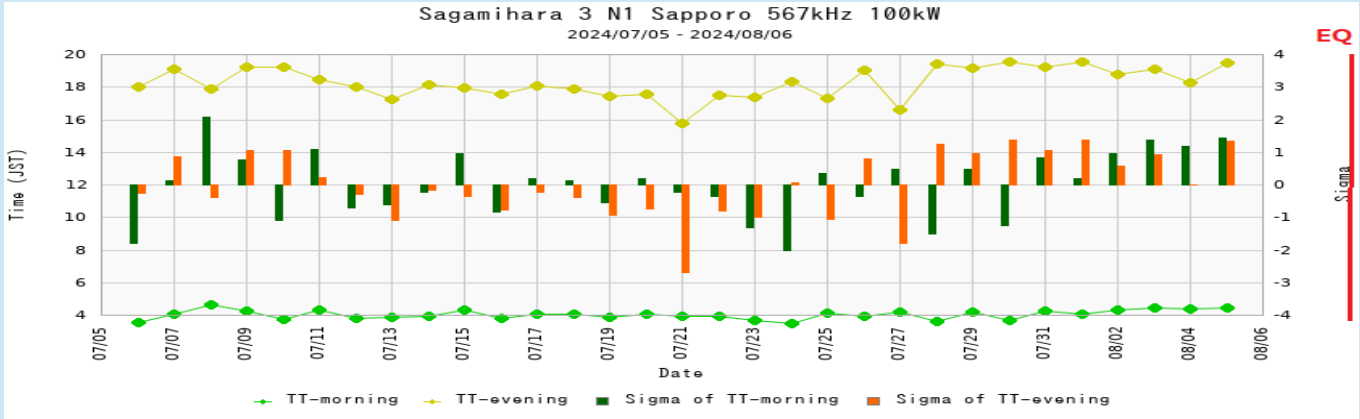
6. Example of Precursor Phenomena

- 3 days before 2024/8/8 Hyuganada EQ M7.1

Kushiro→sagamihara



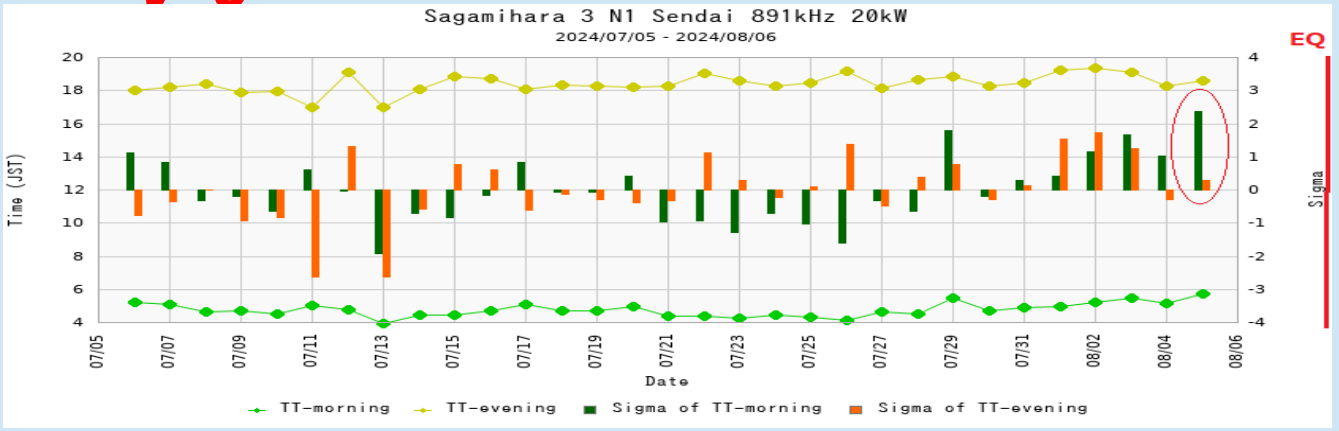
Sapporo→sagamihara



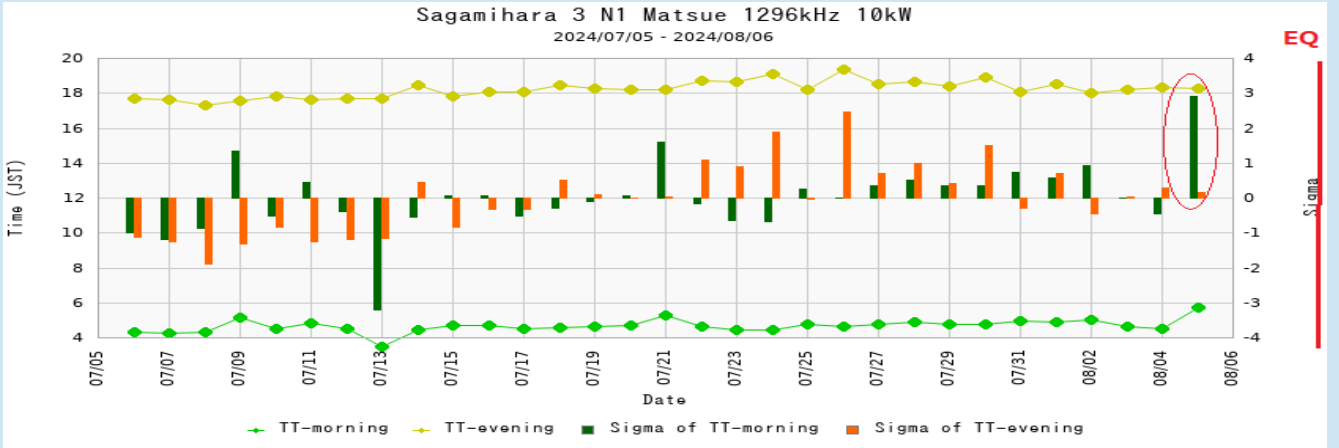
6. Example of Precursor Phenomena

- 3 days before 2024/8/8 Hyuganada EQ M7.1

Sendai→sagamihara



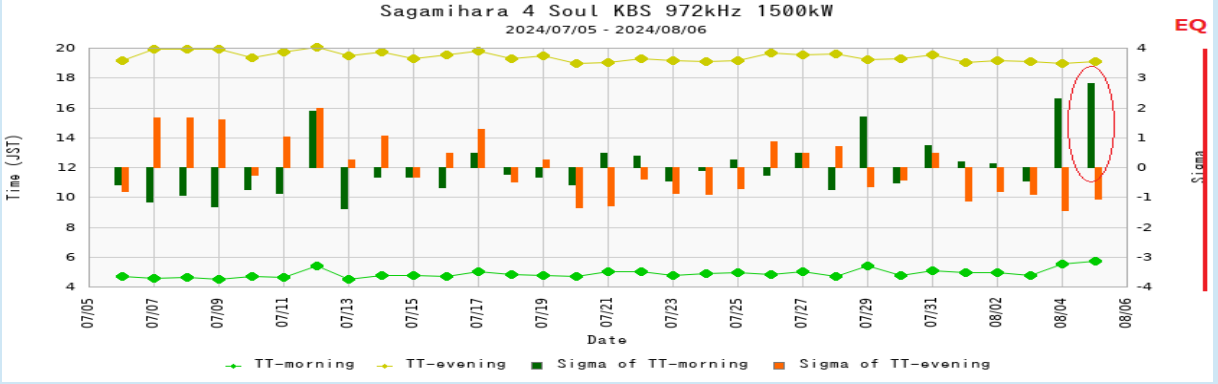
Matsue→sagamihara



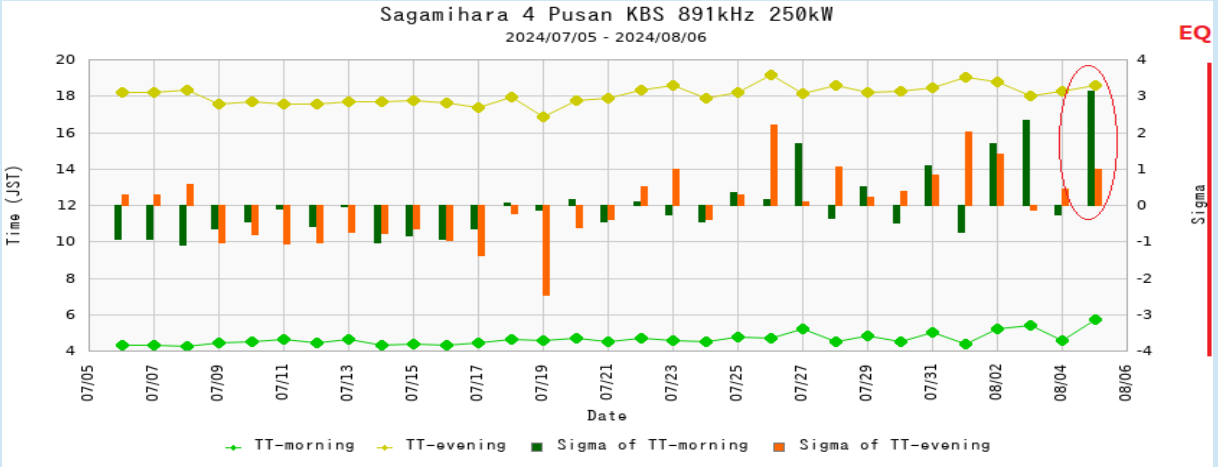
6. Example of Precursor Phenomena

- 3 days before 2024/8/8 Hyuganada EQ M7.1

Seoul→sagamihara



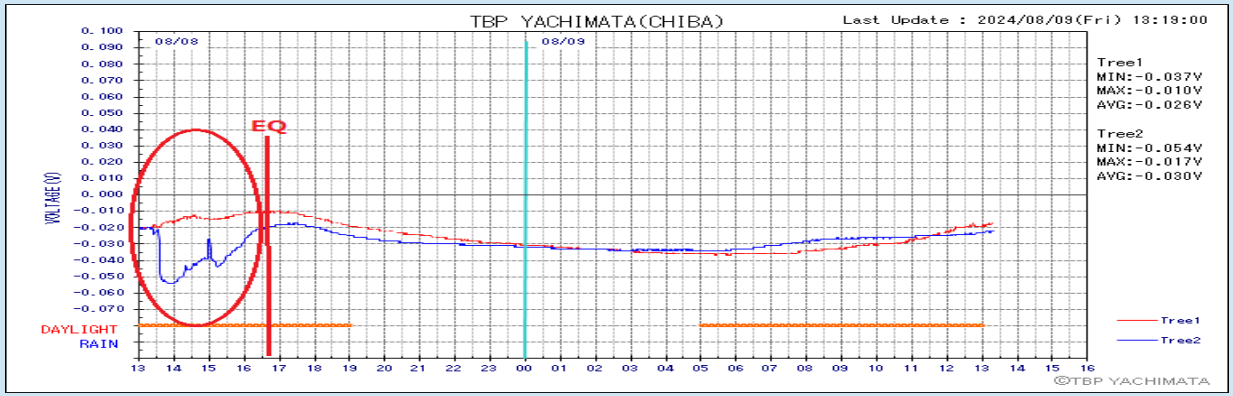
Busan→sagamihara



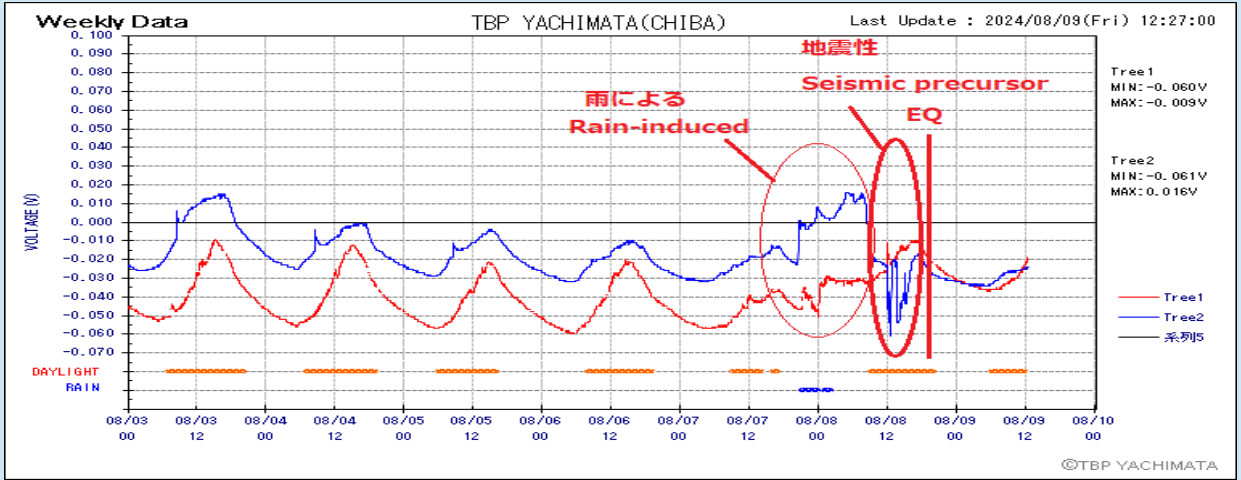
6. Example of Precursor Phenomena

- Tree Bio electric Potential 3 hours before the EQ

Daily data



Weekly data



6. Example of Precursor Phenomena

- Ionospheric disturbance assumption area

7. Prediction Results

- 2024/1/1 ~ 2025/09/15 Announce prediction once a week

Actual EQ \ Anomaly Observation	Yes	No
Yes	7 Times (Hit rate 58%)	2 Times (Missed rate 17%)
No	3 Times (Strikeout rate 25%)	78 Times (Hit rate 87%)

Hit rate including No/No :94%

Confusion Matrix

8. Expectations for Future

- For Research Institutes

Study for 3 methods which we are observing

- For Government Agencies

Try to predict huge earthquake occurrence as Practical disaster prevention information

9. Related Papers

- Seismo Electromagnetic and Seismo Ionospheric Phenomena

V. A. Pilipenkoa, et. al. Schmidt Institute of Physics of the Earth, Russian Academy of Sciences, Moscow, 123242 Russia:

https://www.eqpsj.jp/paper/PhysEth2570055Pilipenko.pdf

- THE PRECURSORY SIGNATURE EFFECT OF THE KOBE EARTHQUAKE ON VLF SUBIONOSPHERIC SIGNALS

M.HAYAKAWA et. al., Electric Communication Univ.

https://www.jepcoc.jp/Paper_Lecture_Mascomm/Hayakawa_Ionosphere_Partuvation_Paper.PDF

Thank you

Thank you for your attention

Any question to Yoshiharu Saito:

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