Micro-Satellite Constellation for Earthquake Precursor Study

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Short-term Earthquake Prediction

• Prediction
  Where?
  When?
  How large?

• Precursor is needed!
Reported Precursors
Uyeda, Nagao & Kamogawa (2011)

- Animal behavior?
- Radon emission?
- Ground water?
- Geo-electric current?
- Ionospheric disturbance?

Some of them may be scientifically real, but it is difficult to statistically prove it.
How to identify a precursor?

We should know standard ionosphere. So, we construct standard ionospheric model.

Model depends on:
- Local time
- Latitude
- Longitude
- Altitude
- Solar flux
- Geomagnetic activity
- etc....

Example of electron density map during geomagnetically quite period

Precise model requires one solar cycle (11 years) observation.
Mission Objectives

• Investigate two plausible ionospheric precursors
• Observe $100 \ M \geq 7$ earthquakes
• Sustain 11-year observation

• Satellite successive operation and constellation
Concluding remarks

• Verify the reported precursor and find a real and practical precursor.
• Detailed mission requirements.
• Forwarding prediction.
• Data share (open source)