



# Analysis of Seismic Activity Observed by Liaoning Precursor Network

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**Abstracts:** The geophysical events recorded by the Liaoning regional precursor station network are mainly divided into three parts. One is to record seismic events (more distant earthquakes), the other is to record magnetic storms (simultaneous records of geomagnetic stations), and to record mineral earthquakes (explosions). For the remarkable earthquakes and global earthquakes that occurred in and around the Chinese mainland, most of the fixed-point deformation instruments, gravity instruments, and a few fluid instruments in our province can record the response to earthquakes.

It shows that the response performance of precursor instruments in our province is good. To effectively monitor the precursor changes of major tectonic activities in the region, to obtain the synchronization anomaly changes of multiple items

with coordination characteristics, to improve the efficiency of the existing precursor data, and to select the truly meaningful precursor observation method is the development direction of the Zhaotai network before the Liaoning earthquake.

**Key words:** Geophysical earthquake Precursor observation

## References

- Cao Fengjuan, Sun Sumei, Yang Muping, Zhang Zhihong, Liu Tianlong and Qian Rui. 2016. Study on the index system of earthquake seismometry with magnitude 5 in Liaoning Province. *China Earthquake Engineering Journal*, 38(3): 398–406.
- Gu Jinping, Zhang Xiaodong, Huang Fuqiong and Wu Jing, 2004. China earthquake precursory anomaly statistical characteristics and application research, China. *Earthquake*, (2): 59–65.

**Table 1 Records of typical Geophysical events recorded by Liaoning Seismic Megatai Network in 2018**

Influence factors	Event parameters	Seismic distance (km)	Station name	Measurement items	Event duration	Range of change
Earthquake	2018-05-28 01:50 Jilin Songyuan M5.7	394	Shenyang	vertical pendulum tilt	5min	NS:5.3(ms) EW:3.11(ms)
		394	Shenyang	gravity	5min	Range of tidal observations(130 * 10-8m / S2). range of filtering observations(131 * 10-8m / S2)
		537	Yingkou	vertical pendulum tilt	5min	NS:2.11(ms) EW:10.20(ms)
		534	Chaoyang	water pipe tilt	5min	NS:2.67(ms) EW:5.68(ms)
		534	Chaoyang	vertical pendulum tilt	3min	NS:35.009(ms) EW:57.002(ms)
		438	Fuxin	body strain	5min	Range of change 10.6E-9
		340	Tieling Longshou Mountain	vertical pendulum tilt	5min	NS:23.0(ms) EW:42.77(ms)
		388	Fushun Muqi	vertical pendulum tilt	5min	NS:90.504(ms) EW:83.182(ms)
		284	Changtu Three Wells	borehole tilt	5min	NS:212.91(ms) EW:427.22(ms)
		549	Jinzhou	body strain	3min	Range of change (8.9e)
		549	Jinzhou	borehole tilt	3min	NS: (938.1ms) (1139.7ms)
		452	Benxi	vertical pendulum tilt	8min	NS:381.650ms EW:20.015ms
		452	Benxi	borehole tilt	8min	NS:118 (10-10), EW:412 (10-10), NE:95.5 (10-10), NW:246 (10-10)
		469	Liaoyang Xiada River	body strain	8min	Range of change 37.56 (10-9)

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- Sun Sumei, Zhang Qi and Kang Xiaoshan, 2017. Change analysis of deformation data affected by rainfall in Liaoning region, China. *Journal of Geodesy and Geodynamics*, 37(4): 174–178.
- Sun Sumei, Ma Li, Xu Zhenfeng and Li Tieliang, 2018. Liaoning lighthouse M5.1. relocating of seismic sequences. China. *Journal of Disaster Prevention and Reduction*, 34(3): 42–48.
- Zhang Min, Zhang Wenlai, Xu Qiulong, Liu Xianlun, Yang Fuxi and Wang Cizhen, 2015. Preliminary analysis of influence of active source experiment on geomagnetic data of Urumqi station, China. *Progress in Geophysics*, (3): 1159–1166.

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