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Einstein Probe aka EP or Aiyinsitan Tanzhen

Launched: 9 January 2024
International Designation: 2024-007A
USSF Catalog Number: 58753

[Einstein Probe](#) (EP) is a Chinese Academy of Sciences, with ESA and CNES participation, space-based observatory mission with all-sky monitoring capabilities to discover and study high-energy transients and variability in X-rays.

EP has the capability of onboard data processing and transient search and fast downlink for alert information. Upon the detection of a transient source, its alert information will be downlinked to the ground segment. The alert data includes the coordinates, flux, spectral hardness ratio, and possibly a simple light curve of the source. To do this, the Beidou-3 system is utilized, taking advantage of its short text message capability and global coverage. To enhance this alert capability to transmit more of the quick-look data of transients, the VHF network system of the CNES which has been built for the SVOM mission, is used.

The alert quick-look data will be helpful for the assessment and diagnostics of the transients. For time critical Target of Opportunity (ToO) observations, the Beidou system will be used to send uplink commands which will enable time-critical ToO observations.

Telecommunications:

X-band	8232 MHz, 102.7 Mbps, CCSDS TM SDID 0x047C Science Data and Telemetry downlink to EP Mission Control
S-band	2032.54 MHz TC and 2207.28 MHz TM CCSDS SCID 0x01D8 Telemetry, Tracking and Control by Satellite Control Centre
L-band	Uplink: 1610-1626.5 MHz: pseudo-random code spread-spectrum. Alert messages to EP Mission Control and Downlink: 1207.14 MHz±10.23 MHz, BPSK(10), 1000 sps, Signal in Space B2b: Target of Opportunity (ToO) commands from EP Mission Control using the BeiDou-3 MEO Global Short Message Communication Service.
VHF band	137.77 MHz, 600 bps 4-CPFSK CCSDS TM SCID 0x01D8, Global Alert Broadcast for the CNES VHF network The RF signal strength is about 10 dB lower than that of SVOM.

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Some websites:

The Einstein Probe Technical [Handbook](#)

ITU Space Explorer [website](#)

[SANA](#)

BeiDou (BDS) satellite navigation [system](#)

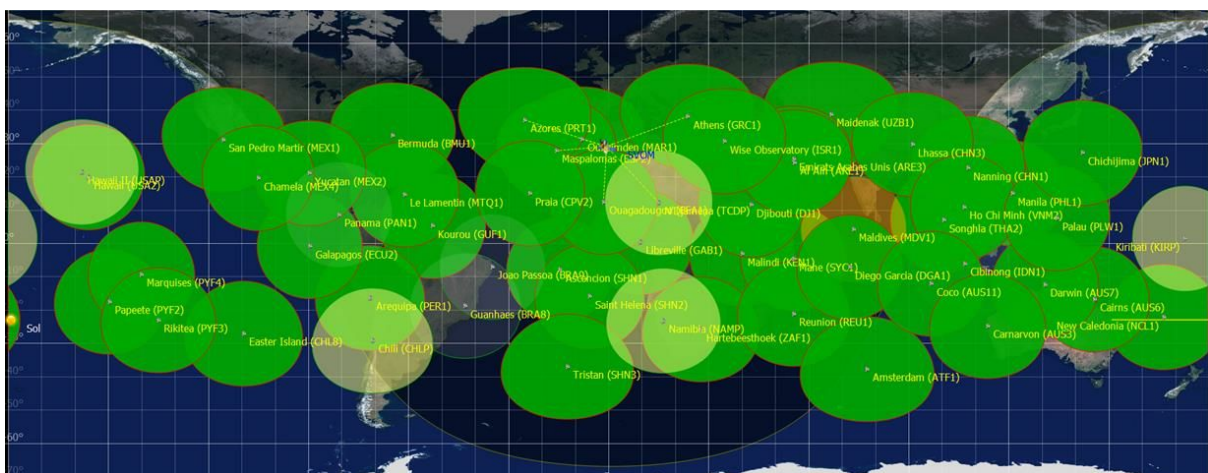
BDS System [Status](#)

BDS [Introduction](#)

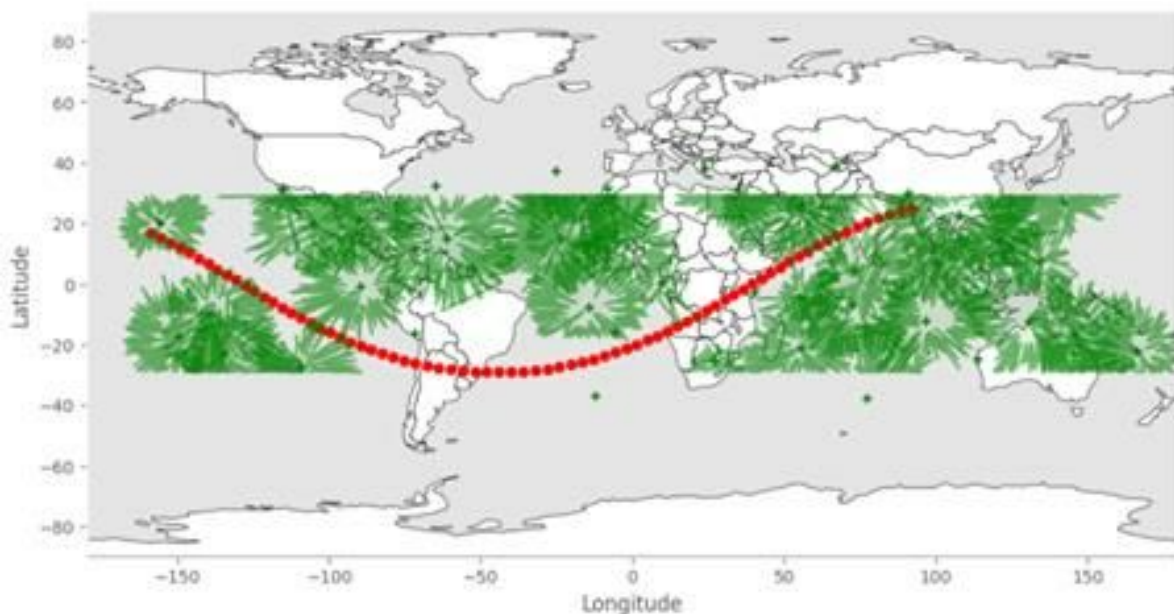
GNSS Receiver [module](#)

CNES VHF [Network](#)

EP and SVOM transmit VHF Alerts on 137.77 MHz with 300 sps 4-CPFSK modulation



CNES VHF Network Theoretical coverage



CNES VHF Network Actual coverage (from acquired EP passes)
Red dots indicate a no reception pass due to lack of ground stations.

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