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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 29077-2024

**Launch-vehicle-to-spacecraft flight environments telemetry
data processing requirement**

星箭界面飞行环境遥测数据处理要求

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1 Scope

GB/T 29077-2024 sets the requirements for processing the telemetry that records the flight environment at the launch vehicle to spacecraft interface. That interface is where the launcher's vibration, shock, acoustic and thermal environment is delivered into the payload, and the measured environment from each flight is what verifies the environmental specification that every future payload will be designed and tested to; if the data is processed inconsistently, the specification drifts away from reality in one direction or the other, either overtesting every satellite or failing to protect them. The standard sets the requirements on the data and its acquisition, the preprocessing, calibration and validation, the time correlation and the identification of the flight events, the analysis methods for each environment, the vibration and shock spectra, the acoustic levels and the thermal profiles, the statistical treatment across measurement points and across flights, the derivation of the flight environment envelopes, and the products and reports delivered. It took effect on 1 September 2024.

This document specifies the types, measurement and control of the flight environment parameters of the rocket-satellite interface during the ascent phase of a launch vehicle (hereinafter referred to as the "rocket"). Parameter range and measurement requirements, data processing and methods, etc. This document is applicable to the processing and analysis of telemetry data of the satellite-rocket interface flight environment.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies. in this document.

GB/T 32455 Launch Vehicle Terminology

3 Terms and definitions

The terms and definitions defined in GB/T 32455 apply to this document.

4 Flight environment parameter types

4.1 Quasi-static loads Quasi-static loads are all external loads on the rocket except gravity. The frequency range is within

10 Hz and is generally represented by acceleration.

4.2 Low frequency vibration Low-frequency vibrations are mainly caused by the structural response of the rocket during ignition and shutdown caused by the engine pulsating thrust, or during transonic flight. Structural response caused by gas pressure fluctuations or transient loads during stage separation. Frequency range

2 Hz~ 100 Hz, generally represented by acceleration.

4.3 High frequency vibration High-frequency vibration is mainly caused by the structural response of the rocket engine jet noise and aerodynamic noise. The maximum value is reached in the transonic section. The frequency range is

10 Hz~2 000 Hz and is generally represented by the power spectrum density of acceleration.

4.4 Acoustic Noise Acoustic noise is mainly the sound pressure generated by rocket engine noise and aerodynamic noise. The frequency range (center frequency) is

25 Hz ~ 10 000 Hz and is generally characterized by sound pressure level.

4.5 Impact The impact environment is mainly caused by the transient response of the separation actions such as fairing separation, stage separation, and satellite-rocket separation. The frequency range is 100 Hz~10 000 Hz, generally represented by acceleration.