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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

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Space object observation data specification

空间物体监测数据规范

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1.Structure and drafting rules for standardization documents" Drafting is required. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed and coordinated by the National Technical Committee for Standardization of Aerospace Technology and Its Applications (SAC/TC 425). The drafting units of this document are. National Astronomical Observatory of the Chinese Academy of Sciences, China Institute of Space Standardization, and Beijing Institute of Tracking and Communication Technology. The main drafters of this document are. Liu Jing, Cheng Haowen, Li David, Jiang Hai, Zhang Yao, Cao Li, Li Gongqiang, Quan Haofang, Wang Kunpeng, Zhao Nanying. Space Object Monitoring Data Specification

1 Scope

China's national specification for space object observation data. It is the companion to the orbital data specification and covers the input rather than the output: the raw observations from radars and optical telescopes that orbit determination consumes. An observation is a measurement of direction, and sometimes range and range rate, at a stated time from a stated position, with a stated uncertainty - and every element of that has to be exchanged for the observation to be usable by anyone but the sensor's owner. The timing is the

exacting part, since an object in low orbit moves several kilometres in a second and an error in the time tag translates directly into an error in position. As the number of tracked objects rises and collision avoidance becomes routine, the ability to combine observations from different networks is what determines how good the resulting catalogue is.

This document defines the spacecraft, launch vehicles, space debris, and other artificial space objects orbiting a celestial body. Elements, format, data structure and description of monitoring data for space objects, including near-Earth objects and near-Earth asteroids orbiting the Sun. This document is applicable to the angle, distance and angle measurements obtained by observations of ground-based optical telescopes, laser ranging telescopes, radars and other monitoring equipment. The generation, transmission, storage and use of space object monitoring data such as speed and luminosity.

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 7408.1-2023 Date and time information exchange representation Part

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 J2000.0 reference systemJ2000.0 reference system The Earth's center of mass is taken as the origin, the mean equator of epoch J2000.0 is the XY plane, and the mean vernal equinox of epoch J2000.0 is the right-hand reference of the X-axis. Examination Department.

3.2 Geocentric celestial reference system; GCRS The right-handed reference frame with the Earth's center of mass as its origin is defined by Resolution B

1.3 of the International Astronomical Union (IAU) in.2000.

Note. The GCRS coordinate axis points close to the J2000.0 reference system, with a difference of about 0.02".

3.3 Horizontal coordinate system The location of the monitoring equipment is taken as the origin, the direction of the plumb line at this point away from the center of the earth is the Z-axis direction, the north direction is the X-axis direction, The east direction is the coordinate system of the Y axis.

3.4 International Terrestrial Reference System (ITRS) The right-handed reference system is

based on the Earth's center of mass as the origin, the Earth's equatorial plane as the XY plane, and the prime meridian as the X-axis. Grid synchronization is a protocol for the Earth reference system defined and implemented by the International Earth Rotation Service (IERS).

3.5 Topocentric coordinate system A type of coordinate system with the location of the monitoring device as the origin.

Note. The direction of the coordinate axis is consistent with the corresponding coordinate system.