

Cartesian position coordinates (X, Y, Z); three Cartesian velocity coordinates (VX, VY, VZ); three spherical position coordinates (Latitude, Longitude, Range); the TABLE NAME; the SPICE reference frame name; the central body (origin).

Distances are in AU; velocities are in km/s; angles are in degrees.

One AU is defined as 1.495978706137E+08 km.

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 Definitions for the trajectory TABLES  
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Summary  
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Description; Table number; Table name prefix -----	SPICE Reference Frame Name	SPICE Central Body Name -----
Heliogr. Inertial; 1; NH_HGI_	HCI	Sun
Heliogr. Inertial; 1; NH_HGI_	HCI	Sun
Heliocentr. Aries Eclip. Date; 2; NH_HAE_DATE_	ECLIPDATE*	Sun
Heliocentr. Aries Eclip. J2000; 3; NH_HAE_J2000_	ECLIPJ2000	Sun
Heliogr.; 4; NH_HG_	IAU_SUN	Sun
Heliocentr. Earth Eclip.; 5; NH_HEE_	HEE	Sun
Heliocentr. Earth Equatorial; 6; NH_HEEQ_	HEEQ	Sun
J2000; 7; NH_J2000_	J2000	Earth
Pluto J2000; 8; NH_PLUTO_J2000_	J2000	Pluto
Jupiter J2000; 9; NH_JUPITER_J2000_	J2000	Jupiter
Pluto IAU; 10; NH_PLUTO_IAU_	IAU_PLUTO	Pluto
Jupiter IAU; 11; NH_JUPITER_IAU_	IAU_JUPITER	Jupiter

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Notes  
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Each TABLE section below starts with a descriptive name, followed by the prefix, in parentheses, for the PDS TABLE object e.g. (NH\_HGI\_) for OBJECT NH\_HGI\_TABLE.

N.B. the TABLE name prefix may or may not be similar to the reference frame name.

These reference frame definitions come from the NH SPICE data set (NH-J/P/SS-SPICE-6-V1.0) and specifically the Frames-Kernel (FK) HELIOSPHERIC\_Vnmny.TF, and use the kernels in that data set for the ephemerides and other dependencies (PCKs) of the dynamic frames. The keyword SPICE\_FILE\_NAME in this label provides an ordered list of the names of the SPICE kernel files used in the creation of these trajectories.

All vectors are geometric; no light time or stellar aberration corrections are applied.

ECLIPDATE is the earth mean ecliptic and equinox of date. Its +Z axis

is perpendicular to the mean ecliptic of date. Its +X axis is the first point in Aries for the mean ecliptic of date. It is identical to ECLIPJ2000 at the J2000 epoch. The word 'Date' refers to the time at which one defines the Vernal Equinox. In this case it is the observation (trajectory) date. Within the SPICE toolkit, ECLIPDATE is implemented via the hard-coded MEAN\_ECLIPTIC\_AND\_EQUINOX\_OF\_DATE model, with the EARTH\_IAU\_1976 precession model, and with the EARTH\_IAU\_1980 obliquity (nutaton) model.

Heliographic Inertial (NH\_HGI\_)

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This trajectory is Sun-centered in the HCI reference frame. HCI has its +Z axis aligned with the solar North pole, and its +X axis at the ascending node on the earth ecliptic of J2000 of the solar equator. The solar frame used here is that of the IAU\_SUN frame frozen (fixed) at the J2000 epoch.

Heliocentric Aries Ecliptic Date (NH\_HAE\_DATE\_)

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This trajectory is Sun-centered in the ECLIPDATE reference frame. ECLIPDATE is the earth mean ecliptic and equinox of date (see Notes above).

Heliocentric Aries Ecliptic J2000 (NH\_HAE\_J2000\_)

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This trajectory is Sun-centered in the ECLIPJ2000 reference frame. ECLIPJ2000 is the earth mean ecliptic and equinox of J2000. Its +Z axis is perpendicular to the mean ecliptic of J2000. Its +X axis is the first point in Aries for the mean ecliptic of J2000.

Heliographic (NH\_HG\_)

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This trajectory is Sun-centered in the IAU\_SUN reference frame. IAU\_SUN has its +Z axis aligned with the solar North pole, and its +X axis fixed at zero longitude on the surface of the Sun, rotating with a periodJ of 25.38 days. Specifically, the zero was defined as the longitude at the ascending node of the equator in the earth ecliptic plane on January 01, 1854 at 12 UT. This frame is also known as the Carrington system. IAU stands for International Astronomical Union.

Heliocentric Earth Ecliptic (NH\_HEE\_)

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This trajectory is Sun-centered in the HEE reference frame. HEE has its +X axis pointing along the geometric vector from the sun to Earth and its +Z axis is the component, orthogonal to the HEE X axis, of the vector normal to the plane of the earth earth ecliptic and equinox of date (ECLIPDATE; see Notes above).

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Heliocentric Earth Equatorial (NH\_HEEQ\_)