

**LIST OF TERMS BY CATEGORY**

Symbol	Abbreviation	Short Description	Comment or definition	CIO / Equinox Based
<b>1. General</b>				
	CIO based	for procedures using the CIO		CIO
	Equinox based	for procedures using the equinox		equinox
<b>2. Systems</b>				
<b>2.1 Celestial systems</b>				
	BCRS	Barycentric Celestial Reference System		
	GCRS	Geocentric Celestial Reference System		
	ICRS	International Celestial Reference System		
	CIRS	Celestial Intermediate Reference System	The CIO and CIP of date	CIO
	ERS	true equinox & equator of date reference system		equinox
		mean equinox and equator of date		equinox
<b>2.2 Terrestrial systems</b>				
	GTRS	Geocentric Terrestrial Reference System		
	ITRS	International Terrestrial Reference System		
	TIRS	Terrestrial Intermediate Reference System		CIO
<b>3. Frames</b>				
	ICRF	International Celestial Reference Frame		
	ITRF	International Terrestrial Reference Frame		
<b>4. Origins</b>				
		ICRS origin		
		J2000.0 origin		
	CIO	Celestial Intermediate Origin	positioned by CIO locator $s$	CIO
	TIO	Terrestrial Intermediate Origin	positioned by TIO locator $s'$	
		mean equinox		equinox
		true equinox		equinox
<b>5. Poles &amp; Pole coordinates</b>				
		ICRS Pole		
		mean pole at J2000.0		
	CIP	Celestial Intermediate Pole		CIO & equinox
$X, Y$		GCRS coordinates of the CIP		CIO
$x_p, y_p$		ITRS coordinates of the CIP		

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<b>6. Meridians</b>				
		ITRF zero-meridian		
		TIO meridian		
		Greenwich meridian (low precision)		
<b>7. Coordinates</b>				
$\alpha$	RA	right ascension	generic term	
$\alpha_i$	RA <sub>i</sub>	intermediate right ascension, CIO right ascension	ERA-compatible	CIO
$\alpha_e$	RA <sub>e</sub>	equinox right ascension, right ascension with respect to the equinox, apparent right ascension	ST-compatible	equinox
$\alpha_{\text{ICRS}}$	RA <sub>ICRS</sub>	ICRS right ascension		
$\delta$	Dec, DEC	declination	generic term	CIO & equinox
$\delta_{\text{ICRS}}$	Dec <sub>ICRS</sub>	declination measured from the ICRS equator		
$\lambda$	Long	longitude	generic term	
$\phi, \phi'$	Lat	latitude, geocentric latitude	generic term	
<b>8. Frame bias</b>				
$\delta\psi_B, \delta\varepsilon_B$		frame bias in longitude and obliquity		
$d\alpha_0$		frame bias in right ascension, equinox offset at J2000.0		
$\xi_0, \eta_0, d\alpha_0$		frame bias in rectangular coordinates	$\xi_0, \eta_0$ are the celestial pole offsets at J2000.0	
<b>9. Earth rotation relationships</b>				
$\theta$	ERA	Earth Rotation Angle		CIO
	GST	Greenwich (apparent) sidereal time (GAST)	GST = GAST GST = GMST + EE	equinox
	GMST	Greenwich mean sidereal time		equinox
	GHA Aries	Greenwich hour angle Aries	GAST	equinox
$E_0$	EO	equation of the origins	$EO = \theta - \text{GST} = \theta - \text{GAST}$	CIO & equinox
$E_e$	EE	equation of the equinoxes	$EE = \text{GAST} - \text{GMST}$	equinox

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<b>10. Precession and Nutation Angles</b>				
$X, Y$		the GCRS coordinates of the CIP that include frame bias, precession and nutation at date $t$		CIO
$\chi_A, \omega_A, \psi_A, \varepsilon_A$		accumulated precession angles from epoch to date $t$		equinox
$\varepsilon_0$	Eps0	obliquity of ecliptic at J2000.0		
$\Delta\psi, \Delta\varepsilon$	Dpsi, Deps	nutation in longitude and obliquity at date $t$		equinox
<b>11. Matrices</b> – the symbols and abbreviations provided here are only suggestions				
$\mathbf{C}, \mathbf{C}(x, y, s)$	$C2I$	matrix that transforms from the celestial (GCRS) to the Celestial Intermediate Reference System	“C” stands for “celestial to”	CIO
$\mathbf{Q}, \mathbf{Q}(x, y, s)$	$I2C$	matrix from the Celestial Intermediate Reference System to the celestial (GCRS)	$\mathbf{Q} = \mathbf{C}^{-1}$ used by IERS.	CIO
$\mathbf{B}$	$C2J$	frame bias matrix, GCRS to J2000.0		equinox
$\mathbf{P}$	$J2m$	precession matrix, J2000.0 to mean equinox of date		equinox
$\mathbf{N}$	$m2t$	nutation matrix, mean equinox of date to true equinox of date		equinox
$\mathbf{NP}$	$J2t$	precession-nutation matrix, J2000.0 to true equinox of date		equinox
$\mathbf{NPB}$	$C2t$	combined bias, precession, nutation matrix, GCRS to true equinox and equator of date		equinox
$\mathbf{W}(x_p, y_p, s')$	$T2T$	polar motion matrix, matrix from the terrestrial system to the ITRS		CIO & equinox
<b>12. Computation of Hour Angle: CIO &amp; Equinox Based Methods</b>				
$\theta$	ERA	Earth Rotation Angle		CIO
	LERA	local Earth Rotation Angle	$\text{LERA} = \theta + \lambda$	CIO
$H$	GHA	Greenwich hour angle (measured from zero longitude)	$H = \theta - \alpha_i = \text{GAST} - \alpha_e$	CIO & equinox
$h$	LHA	local hour angle	$h = \theta + \lambda - \alpha_i = \text{LAST} - \alpha_e$	CIO & equinox
	GST (GAST)	Greenwich sidereal time (Greenwich apparent sidereal time)	GST = GAST GST = GMST + EE	equinox
	GMST	Greenwich mean sidereal time		equinox
	LMST	local mean sidereal time	$\text{LMST} = \text{GMST} + \lambda$	equinox
	LAST	local apparent sidereal time	$\text{LAST} = \text{GAST} + \lambda$	equinox
	LHA Aries	local hour angle Aries	LAST	equinox