Annex J
(normative)

Deprecated SRM concept instances

J.1 Introduction

This annex contains tables defining those SRM concept instances whose use is deprecated as defined in Annex G. Users are strongly cautioned that deprecated concept instances are expected to be removed in a future version of this International Standard.

J.2 RDs

This sub-annex presents the specifications of deprecated RDs. RD specification elements are defined in Table 7.9. Table J.1 is a directory of these RDs organized by type of ellipsoid. The RD entries in each table are grouped by celestial object type and then ordered alphabetically by their label.

Table J.1 — Deprecated RD specification directory

Deprecated RD specification table	Table
Deprecated oblate ellipsoid RDs	Table J.2
Deprecated sphere RDs	Table J.3
Deprecated prolate ellipsoid RDs	Table J.4
Deprecated tri-axial ellipsoid RDs	Table J.5

Table J.2 — Deprecated oblate ellipsoid RDs

RD label	RD code	Description	Parameters			Date	References	Notes
			Major semi-axis, a	Flattening, f	Error estimate			
Object type: Earth								
WGS_1960	143	World Geodetic System 1960	6 378 165	1/298,3	Assumed precise	1960	[DIGEST, Table 6.1, "WS"]	Superseded by WGS_1972 and WGS_1984, based on more recent information contained in 83502T.
WGS_1966	144	World Geodetic System 1966	6 378 145	1/298,25	Unknown	1966	[DIGEST, Table 6.1, "WC"]	Superseded by WGS_1972 and WGS_1984, based on more recent information contained in 83502T.
Object type: Planet (non-Earth)								
Object type: Satellite								
Object type: Sun								

Table J.3 — Deprecated sphere RDs

RD label	RD code	Description	Parameters		Date	References	Notes
			Radius, r	Error estimate			
Object type: Earth							
Object type: Planet (non-Earth)							
EROS_2000	54	Eros (asteroid 433, a minor planet)	7 311	As specified accompanying the parameter value	2000	[RIIC, Table VI, "Eros"]	Superseded by EROS_2002, based on more accurate information in RIIC15.

MERCURY-_1988	92	Mercury	2 439 700	As specified accompanying the parameter value	1988	[RIIC, Table IV, "Mercury"]	Superseded by MERCURY_2015, based on more accurate information in RIIC15.
PLUTO_1994	116	Pluto (minor planet 134340, a dwarf planet)	1 195 000	As specified accompanying the parameter value	1994	[RIIC, Table IV, "Pluto"]	Superseded by PLUTO_2017, based on more accurate information in RIIC15.
Object type: Satellite							
CHARON_1991	32	Charon (satellite of Pluto)	593 000	As specified accompanying the parameter value	1991	[RIIC, Table V, "Charon"]	Superseded by CHARON_2017, based on more accurate information in RIIC15.
DIONE_1982	50	Dione (satellite of Saturn)	560 000	As specified accompanying the parameter value	1982	[RIIC, Table V, "Dione"]	Superseded by DIONE_2010, based on more accurate information in RIIC15.
HELENE_1992	69	Helene (satellite of Saturn)	17 500	As specified accompanying the parameter value	1992	[SEID, Table 15.10, "Helene"]	Superseded by HELENE_2013, based on more accurate information in RIIC15.
IAPETUS_1988	75	Iapetus (satellite of Saturn)	718 000	As specified accompanying the parameter value	1988	[RIIC, Table V, "Iapetus"]	Superseded by IAPETUS_2010, based on more accurate information in RIIC15.
PAN_1991	110	Pan (satellite of Saturn)	10 000	As specified accompanying the parameter value	1991	[RIIC, Table V, "Pan"]	Superseded by PAN_2013, based on more accurate information contained in RIIC15.
RHEA_1988	121	Rhea (satellite of Saturn)	764 000	As specified accompanying the parameter value	1988	[RIIC, Table V, "Rhea"]	Superseded by RHEA_2010, based on more accurate information in RIIC15.
TITAN_1982	134	Titan (satellite of Saturn)	2 575 000	As specified accompanying the parameter value	1982	[RIIC, Table V, "Titan"]	Superseded by TITAN_2010, based on more accurate information in RIIC15.
Object type: Sun							
SUN_1992	129	Sun	696 000 000	As specified accompanying the parameter value	1992	[SEID, Table 15.4, "Sun"]	Superseded by SUN_2008, based on more accurate information in RIIC15.

Table J.4 — Deprecated prolate ellipsoid RDs

In this International Standard, no prolate ellipsoid RDs are deprecated, therefore the table is empty.

Table J.5 — Deprecated tri-axial ellipsoid RDs

RD label	RD code	Description	Parameters				Date	References	Notes
			Semi-axis, *a*	Semi-axis, *b*	Semi-axis, *c*	Error estimate			
Object type: Earth									
Object type: Planet (non-Earth)									
KLEOPATRA_2000	83	Kleopatra (asteroid 216, a minor planet)	108 500	47 000	40 500	As specified accompanying the parameter value	2000	[RIIC, Table VI, "Kleopatra"]	Reclassified and removed from RIIC06.
Object type: Satellite									
ATLAS_1988	22	Atlas (satellite of Saturn)	18 500	17 200	13 500	As specified accompanying the parameter value	1988	[RIIC, Table V, "Atlas"]	Superseded by ATLAS_2013, based on more accurate information in RIIC15.
CALLISTO_2000	29	Callisto (satellite of Jupiter)	2 409 4 00	2 409 2 00	2 409 3 00	As specified accompanying the parameter value	2000	[RIIC, Table V, "Callisto"]	Superseded by CALLISTO_2001, based on more accurate information in RIIC15.
CALYPSO_1988	30	Calypso (satellite of Saturn)	15 000	8 000	8 000	As specified accompanying the parameter value	1988	[RIIC, Table V, "Calypso"]	Superseded by CALYPSO_2013, based on more accurate information in RIIC15.
DEIMOS_1988	46	Deimos (satellite of Mars)	7 500	6 100	5 200	As specified accompanying the parameter value	1988	[RIIC, Table V, "Deimos"]	Superseded by DEIMOS_1993, based on more accurate information in RIIC15.
ENCELADUS_1994	52	Enceladus (satellite of Saturn)	256 300	247 300	244 600	As specified accompanying the parameter value	1994	[RIIC, Table V, "Enceladus"]	Superseded by ENCELADUS_2016, based on more accurate information in RIIC15.

EPIMETHEUS_-1988	53	Epimetheus (satellite of Saturn)	69 000	55 000	55 000	As specified accompanying the parameter value	1988	[RIIC, Table V, "Epimetheus"]	Superseded by EPIMETHEUS_2013, based on more accurate information in RIIC15.
EUROPA_2000	55	Europa (satellite of Jupiter)	1 564 1 30	1 561 2 30	1 560 9 30	As specified accompanying the parameter value	2000	[RIIC, Table V, "Europa"]	Superseded by EUROPA_2007, based on more accurate information in RIIC15.
GANYMEDE_2000	65	Ganymede (satellite of Jupiter)	2 632 4 00	2 632 2 90	2 632 3 50	As specified accompanying the parameter value	2000	[RIIC, Table V, "Ganymede"]	Superseded by GANYMEDE_2007, based on more accurate information in RIIC15.
HYPERION_2000	73	Hyperion (satellite of Saturn)	164 000	130 000	107 000	As specified accompanying the parameter value	2000	[RIIC, Table V, "Hyperion"]	Superseded by HYPERION_2010, based on more accurate information in RIIC15.
IO_2000	79	Io (satellite of Jupiter)	1 829 4 00	1 819 3 00	1 815 7 00	As specified accompanying the parameter value	2000	[RIIC, Table V, "Io"]	Superseded by IO_1998, based on more accurate information in RIIC15.
JANUS_1988	80	Janus (satellite of Saturn)	97 000	95 000	77 000	As specified accompanying the parameter value	1988	[RIIC, Table V, "Janus"]	Superseded by JANUS_2013, based on more accurate information in RIIC15.
MIMAS_1994	94	Mimas (satellite of Saturn)	209 100	196 200	191 400	As specified accompanying the parameter value	1994	[RIIC, Table V, "Mimas"]	Superseded by MIMAS_2010, based on more accurate information in RIIC15.
PANDORA_1988	111	Pandora (satellite of Saturn)	55 000	44 000	31 000	As specified accompanying the parameter value	1988	[RIIC, Table V, "Pandora"]	Superseded by PANDORA_2013, based on more accurate information in RIIC15.
PHOBOS_1988	113	Phobos (satellite of Mars)	13 400	11 200	9 200	As specified accompanying the parameter value	1988	[RIIC, Table V, "Phobos"]	Superseded by PHOBOS_2010, based on more accurate information in RIIC15.

PHOEBE_1988	114	Phoebe (satellite of Saturn)	115 000	110 000	105 000	As specified accompanying the parameter value	1988	[RIIC, Table V, "Phoebe"]	Superseded by PHOEBE_2010, based on more accurate information in RIIC15.
PROMETHEUS-_1988	118	Prometheus (satellite of Saturn)	74 000	50 000	34 000	As specified accompanying the parameter value	1988	[RIIC, Table V "Prometheus"]	Superseded bu PROMETHEUS_2013, based on more accurate information in RIIC15.
TELESTO_1988	130	Telesto (satellite of Saturn)	15 000	12 500	7 500	As specified accompanying the parameter value	1988	[RIIC, Table V, "Telesto"]	Superseded bu TELESTO_2013, based on more accurate information in RIIC15.
TETHYS_1991	131	Tethys (satellite of Saturn)	535 600	528 200	525 800	As specified accompanying the parameter value	1991	[RIIC, Table V, "Tethys"]	Superseded by TETHYS_2010, based on more accurate information in RIIC15.
Object type: Sun									

J.3 ORMs

This sub-annex presents the specifications of deprecated ORMs and their associated RTs. ORM specification elements are defined in Table 7.33, and RT specification elements are defined in Table 7.34. Table J.6 is a directory of these ORMs organized by whether they are object-fixed or dynamic, and by type of object. The ORM entries in each table are grouped by celestial object type and then ordered alphabetically by their label.

Table J.6 — Deprecated ORM specification directory

Deprecated ORM specification table	Table
Deprecated abstract object ORMs	Table J.7
Deprecated object-fixed ERMs	Table J.8
Deprecated dynamic ERMs	Table J.9
Deprecated time-fixed instances of dynamic ERMs	Table J.10
Deprecated object-fixed planet (non-Earth) ORMs	Table J.12
Deprecated dynamic planet (non-Earth) ORMs	Table J.14
Deprecated time-fixed instances of dynamic planet (non-Earth) ORMs	Table J.15
Deprecated object-fixed satellite ORMs	Table J.16
Deprecated dynamic satellite ORMs	Table J.18
Deprecated time-fixed instances of dynamic satellite ORMs	Table J.19
Deprecated object-fixed stellar ORMs	Table J.20
Deprecated stellar ORMs	Table J.22
Deprecated time-fixed instances of dynamic stellar ORMs	Table J.23

Table J.7 — Deprecated abstract object ORMs

In this International Standard, no abstract object ORMs are deprecated, therefore the table is empty.

Table J.8 — Deprecated object-fixed ERMs

In this International Standard, no object-fixed ERMs are deprecated, therefore the table is empty.

Table J.9 — Deprecated dynamic ERMs

In this International Standard, no dynamic ERMs are deprecated, therefore the table is empty.

Table J.10 — Deprecated time-fixed instances of dynamic ERMs

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
GEOMAGNETIC_1945	77	DGRF 1945	WGS_1984	1945 OBRS CELESTIOMAGNETIC Note: Object-fixed base epoch for the 5 year period 1945 to 1950.	Vicinity of Earth	BI_AXIS-_ORIGIN_3D	n/a	[DAGF, Table I, "DGRF 1945"]	Superseded by GEOMAGNETIC_1945-_IGRF13, based on more accurate information in IAGA
GEOMAGNETIC_1950	78	DGRF 1950	WGS_1984	1950 OBRS CELESTIOMAGNETIC Note: Object-fixed base epoch for the 5 year period 1950 to 1955.	Vicinity of Earth	BI_AXIS-_ORIGIN_3D	n/a	[DAGF, Table I, "DGRF 1950"]	Superseded by GEOMAGNETIC_1950-_IGRF13, based on more accurate information in IAGA
GEOMAGNETIC_1955	79	DGRF 1955	WGS_1984	1955 OBRS CELESTIOMAGNETIC Note: Object-fixed base epoch for the 5 year period 1955 to 1960.	Vicinity of Earth	BI_AXIS-_ORIGIN_3D	n/a	[DAGF, Table I, "DGRF 1955"]	Superseded by GEOMAGNETIC_1955-_IGRF13, based on more accurate information in IAGA
GEOMAGNETIC_1960	80	DGRF 1960	WGS_1984	1960 OBRS CELESTIOMAGNETIC Note: Object-fixed base epoch for the 5 year period 1960 to 1965.	Vicinity of Earth	BI_AXIS-_ORIGIN_3D	n/a	[DAGF, Table I, "DGRF 1960"]	Superseded by GEOMAGNETIC_1960-_IGRF13, based on more accurate information in IAGA

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
GEOMAGNETIC_1965	81	DGRF 1965	WGS_1984	1965 OBRS CELESTIOMAGNETIC Note: Object-fixed base epoch for the 5 year period 1965 to 1970.	Vicinity of Earth	BI_AXIS-_ORIGIN_3D	n/a	[DAGF, Table I, "DGRF 1965"]	Superseded by GEOMAGNETIC_1965-_IGRF13, based on more accurate information in IAGA
GEOMAGNETIC_1970	82	DGRF 1970	WGS_1984	1970 OBRS CELESTIOMAGNETIC Note: Object-fixed base epoch for the 5 year period 1970 to 1975.	Vicinity of Earth	BI_AXIS-_ORIGIN_3D	n/a	[DAGF, Table I, "DGRF 1970"]	Superseded by GEOMAGNETIC_1970-_IGRF13, based on more accurate information in IAGA
GEOMAGNETIC_1975	83	DGRF 1975	WGS_1984	1975 OBRS CELESTIOMAGNETIC Note: Object-fixed base epoch for the 5 year period 1975 to 1980.	Vicinity of Earth	BI_AXIS-_ORIGIN_3D	n/a	[DAGF, Table I, "DGRF 1975"]	Superseded by GEOMAGNETIC_1975-_IGRF13, based on more accurate information in IAGA
GEOMAGNETIC_1980	84	DGRF 1980	WGS_1984	1980 OBRS CELESTIOMAGNETIC Note: Object-fixed base epoch for the 5 year period 1980 to 1985.	Vicinity of Earth	BI_AXIS-_ORIGIN_3D	n/a	[DAGF, Table I, "DGRF 1980"]	Superseded by GEOMAGNETIC_1980-_IGRF13, based on more accurate information in IAGA

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
GEOMAGNETIC_1985	85	DGRF 1985	WGS_1984	1985 OBRS CELESTIOMAGNETIC Note: Object-fixed base epoch for the 5 year period 1985 to 1990.	Vicinity of Earth	BI_AXIS-_ORIGIN_3D	n/a	[DAGF, Table I, "DGRF 1985"]	Superseded by GEOMAGNETIC_1985-_IGRF13, based on more accurate information in IAGA
GEOMAGNETIC_1990	86	DGRF 1990	WGS_1984	1990 OBRS CELESTIOMAGNETIC Note: Object-fixed base epoch for the 5 year period 1990 to 1995.	Vicinity of Earth	BI_AXIS-_ORIGIN_3D	n/a	[DAGF, Table I, "DGRF 1990"]	Superseded by GEOMAGNETIC_1990-_IGRF13, based on more accurate information in IAGA
GEOMAGNETIC_1995	87	IGRF 1995	WGS_1984	1995 OBRS CELESTIOMAGNETIC Note: Object-fixed base epoch for the 5 year period 1995 to 2000.	Vicinity of Earth	BI_AXIS-_ORIGIN_3D	n/a	[DAGF, Table I, "IGRF 1995"]	Superseded by GEOMAGNETIC_1995-_IGRF13, based on more accurate information in IAGA
GEOMAGNETIC_2000	88	IGRF 2000	WGS_1984	2000 OBRS CELESTIOMAGNETIC Note: Object-fixed base epoch for the 5 year period 2000 to 2005.	Vicinity of Earth	BI_AXIS-_ORIGIN_3D	n/a	[DAGF, Table I, "IGRF 2000"]	Superseded by GEOMAGNETIC_2000-_IGRF13, based on more accurate information in IAGA

Table J.11 — Deprecated time-fixed instances of dynamic ERM RTs

ORM label	RT label	RT code	RT region	STT label and parameter values	Date published	References	Notes
GEOMAGNETIC_1945	GEOMAGNETIC_1945-_DGRF	105	Global (Earth)	PV_YZ_ROTATE ω_1 = 11,53°, ω_2 = -68,53°. Note: Centred dipole model northern pole.	1945	[DAGF, Table I, "DGRF 1945"]	Superseded by GEOMAGNETIC_1945_IGRF13, based on more accurate information in [IAGA
GEOMAGNETIC_1950	GEOMAGNETIC_1950-_DGRF	106	Global (Earth)	PV_YZ_ROTATE ω_1 = 11,53°, ω_2 = -68,85°. Note: Centred dipole model northern pole.	1950	[DAGF, Table I, "DGRF 1950"]	Superseded by GEOMAGNETIC_1950_IGRF13, based on more accurate information in [IAGA
GEOMAGNETIC_1955	GEOMAGNETIC_1955-_DGRF	107	Global (Earth)	PV_YZ_ROTATE ω_1 = 11,54°, ω_2 = -69,16°. Note: Centred dipole model northern pole.	1955	[DAGF, Table I, "DGRF 1955"]	Superseded by GEOMAGNETIC_1955_IGRF13, based on more accurate information in [IAGA
GEOMAGNETIC_1960	GEOMAGNETIC_1960-_DGRF	108	Global (Earth)	PV_YZ_ROTATE ω_1 = 11,49°, ω_2 = -69,47°. Note: Centred dipole model northern pole.	1960	[DAGF, Table I, "DGRF 1960"]	Superseded by GEOMAGNETIC_1960_IGRF13, based on more accurate information in [IAGA
GEOMAGNETIC_1965	GEOMAGNETIC_1965-_DGRF	109	Global (Earth)	PV_YZ_ROTATE ω_1 = 11,47°, ω_2 = -69,85°. Note: Centred dipole model northern pole.	1965	[DAGF, Table I, "DGRF 1965"]	Superseded by GEOMAGNETIC_1965_IGRF13, based on more accurate information in [IAGA

ORM label	RT label	RT code	RT region	STT label and parameter values	Date published	References	Notes
GEOMAGNETIC_1970	GEOMAGNETIC_1970-_DGRF	110	Global (Earth)	PV_YZ_ROTATE ω_1 = 11,41°, ω_2 = -70,18°. Note: Centred dipole model northern pole.	1970	[DAGF, Table I, "DGRF 1970"]	Superseded by GEOMAGNETIC_1970_IGRF13, based on more accurate information in [IAGA
GEOMAGNETIC_1975	GEOMAGNETIC_1975-_DGRF	111	Global (Earth)	PV_YZ_ROTATE ω_1 = 11,31°, ω_2 = -70,47°. Note: Centred dipole model northern pole.	1975	[DAGF, Table I, "DGRF 1975"]	Superseded by GEOMAGNETIC_1975_IGRF13, based on more accurate information in [IAGA
GEOMAGNETIC_1980	GEOMAGNETIC_1980-_DGRF	112	Global (Earth)	PV_YZ_ROTATE ω_1 = 11,19°, ω_2 = -70,76°. Note: Centred dipole model northern pole.	1980	[DAGF, Table I, "DGRF 1980"]	Superseded by GEOMAGNETIC_1980_IGRF13, based on more accurate information in [IAGA
GEOMAGNETIC_1985	GEOMAGNETIC_1985-_DGRF	113	Global (Earth)	PV_YZ_ROTATE ω_1 = 11,03°, ω_2 = -70,9°. Note: Centred dipole model northern pole.	1985	[DAGF, Table I, "DGRF 1985"]	Superseded by GEOMAGNETIC_1985_IGRF13, based on more accurate information in [IAGA
GEOMAGNETIC_1990	GEOMAGNETIC_1990-_DGRF	114	Global (Earth)	PV_YZ_ROTATE ω_1 = 10,87°, ω_2 = -71,11°. Note: Centred dipole model northern pole.	1990	[DAGF, Table I, "DGRF 1990"]	Superseded by GEOMAGNETIC_1990_IGRF13, based on more accurate information in [IAGA

ORM label	RT label	RT code	RT region	STT label and parameter values	Date published	References	Notes
GEOMAGNETIC_1995	GEOMAGNETIC_1995-_IGRF	115	Global (Earth)	PV_YZ_ROTATE ω_1 = 10,7°, ω_2 = -71,41°. Note: Centred dipole model northern pole.	1995	[DAGF, Table I, "IGRF 1995"]	Superseded by GEOMAGNETIC_1995_IGRF13, based on more accurate information in [IAGA
GEOMAGNETIC_2000	GEOMAGNETIC_2000-_IGRF	116	Global (Earth)	PV_YZ_ROTATE ω_1 = 10,46°, ω_2 = -71,57°. Note: Centred dipole model northern pole.	2000	[DAGF, Table I, "IGRF 2000"]	Superseded by GEOMAGNETIC_2000_IGRF13, based on more accurate information in [IAGA

Table J.12 — Deprecated object-fixed planet (non-Earth) ORMs

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
EROS_2000	63	Eros (asteroid 433)	This is the reference ORM for Eros (asteroid 433, a minor planet).	2000 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table III, "Eros"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Eros, Global	TRI_AXIAL-_ELLIPSOID	EROS_2000	[RIIC, Table III, "Eros"]	Superseded by EROS_2002, based on more accurate information in RIIC15

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
MERCURY-_1988	146	Mercury	This is the reference ORM for Mercury (a planet).	1988 The *x*-positive *xz*-half-plane as determined by an observable fixed surface feature and approximated by an ephemeris as specified in {Table I, "Mercury"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Mercury, Global	SPHERE	MERCURY_1988	[RIIC, Table I, "Mercury"]	Superseded by MERCURY_2015 and MERCURY_SPHERE-_2015, based on more accurate information in RIIC15
PLUTO_1994	187	Pluto	PLUTO_2017	1994 The *x*-positive *xz*-half-plane as determined by an observable fixed surface feature and approximated by an ephemeris as specified in {Table I, "Pluto"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Pluto, Global	SPHERE	PLUTO_1994	[RIIC, Table I, "Pluto"]	Superseded by PLUTO_2017, based on more accurate information in RIIC15

Table J.13 — Deprecated object-fixed planet (non-Earth) RTs

ORM label	RT label	RT code	RT region	STT label and parameter values	Date published	References	Notes
EROS_2000	EROS_2000_IDENTITY	74	Global (Eros)	IDENTITY The reference ORM for object Eros.	2000	[RIIC, Table III, "Eros"]	Superseded by EROS_2002, based on more accurate information in RIIC15
MERCURY-_1988	MERCURY_1988_IDENTITY	170	Global (Mercury)	IDENTITY	1988	[RIIC, Table I, "Mercury"]	Superseded by MERCURY_2015 and MERCURY_SPHERE_2015, based on more accurate information in RIIC15
PLUTO_1994	PLUTO_1994_IDENTITY	249	Global (Pluto)	IDENTITY	1994	[RIIC, Table I, "Pluto"]	Superseded by PLUTO_2017, based on more accurate information in RIIC15

Table J.14 — Deprecated dynamic planet (non-Earth) ORMs

In this International Standard, no dynamic planet (non-Earth) ORMs are deprecated, therefore the table is empty.

Table J.15 — Deprecated time-fixed instances of dynamic planet (non-Earth) ORMs

In this International Standard, no time-fixed instances of dynamic planet (non-Earth) ORMs are deprecated, therefore the table is empty.

Table J.16 — Deprecated object-fixed satellite ORMs

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
ATLAS_1988	15	Atlas	This is the reference ORM for Atlas (a satellite of Saturn).	1988 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table 2, "Atlas"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Atlas, Global	OBLATE-_ELLIPSOID	ATLAS_1988	[RIIC, Table II, "Atlas"]	Superseded by ATLAS_2013, based on more accurate information in RIIC15
CALLISTO_2000	28	Callisto	This is the reference ORM for Callisto (a satellite of Jupiter).	2000 The *x*-positive *xz*-half-plane as determined by an observable fixed surface feature and approximated by an ephemeris as specified in {Table II, "Callisto"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Callisto, Global	SPHERE	CALLISTO_2000	[RIIC, Table II, "Callisto"]	Superseded by CALLISTO_2001, based on more accurate information in RIIC15
CALYPSO_1988	29	Calypso	This is the reference ORM for Calypso (a satellite of Saturn).	1988 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table II, "Calypso"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Calypso, Global	TRI_AXIAL-_ELLIPSOID	CALYPSO_1988	[RIIC, Table II, "Calypso"]	Superseded by CALYPSO_2013, based on more accurate information in RIIC15

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
CHARON_1991	36	Charon	This is the reference ORM for Charon (a satellite of Pluto).	1991 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table II, "Charon"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Charon, Global	SPHERE	CHARON_1991	[RIIC, Table II, "Charon"]	Superseded by CHARON_2017, based on more accurate information in RIIC15
DEIMOS_1988	45	Deimos	This is the reference ORM for Deimos (a satellite of Mars).	1988 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table II, "Deimos"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Deimos, Global	TRI_AXIAL-_ELLIPSOID	DEIMOS_1988	[RIIC, Table II, "Deimos"]	Superseded by DEIMOS_1993, based on more accurate information in RIIC15
DIONE_1982	48	Dione	This is the reference ORM for Dione (a satellite of Saturn).	1982 The *x*-positive *xz*-half-plane as determined by an observable fixed surface feature and approximated by an ephemeris as specified in {Table II, "Dione"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Dione, Global	SPHERE	DIONE_1982	[RIIC, Table II, "Dione"]	Superseded by DIONE_2010, based on more accurate information in RIIC15

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
ENCELADUS-_1994	61	Enceladus	This is the reference ORM for Enceladus (a satellite of Saturn).	1994 The *x*-positive *xz*-half-plane as determined by an observable fixed surface feature and approximated by an ephemeris as specified in {Table II, "Enceladus"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Encela-dus, Global	SPHERE	ENCELADUS-_1994	[RIIC, Table II, "Enceladus"]	Superseded by ENCELADUS_2016, based on more accurate information in RIIC15
EPIMETHEUS-_1988	62	Epimetheus	This is the reference ORM for Epimetheus (a satellite of Saturn).	1988 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table II, "Epimetheus"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Epime-theus, Global	TRI_AXIAL-_ELLIPSOID	EPIMETHEUS-_1988	[RIIC, Table II, "Epime-theus"]	Superseded by EPIMETHEUS_2013, based on more accurate information in RIIC15
EUROPA_2000	66	Europa	This is the reference ORM for Europa (a satellite of Jupiter).	2000 The *x*-positive *xz*-half-plane as determined by an observable fixed surface feature and approximated by an ephemeris as specified in {Table II, "Europa"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Europa, Global	TRI_AXIAL-_ELLIPSOID	EUROPA_2000	[RIIC, Table II, "Europa"]	Superseded by EUROPA_2007, based on more accurate information in RIIC15

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
GANYMEDE-_2000	73	Ganymede	This is the reference ORM for Ganymede (a satellite of Jupiter).	2000 The *x*-positive *xz*-half-plane as determined by an observable fixed surface feature and approximated by an ephemeris as specified in {Table II, "Ganymede"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Gany-mede, Global	TRI_AXIAL-_ELLIPSOID	GANYMEDE-_2000	[RIIC, Table II, "Ganymede"]	Superseded by GANYMEDE_2007, based on more accurate information in RIIC15
HELENE_1992	93	Helene	This is the reference ORM for Helene (a satellite of Saturn).	1992 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table II, "Helene"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Helene, Global	TRI_AXIAL-_ELLIPSOID	HELENE_1992	[RIIC, Table II, "Helene"]	Superseded by HELENE_2013, based on more accurate information in RIIC15

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
IAPETUS_1988	103	Iapetus	This is the reference ORM for Iapetus (a satellite of Saturn).	1988 The *x*-positive *xz*-half-plane as determined by an observable fixed surface feature and approximated by an ephemeris as specified in {Table II, "Iapetus"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Iapetus, Global	SPHERE	IAPETUS_1988	[RIIC, Table II, "Iapetus"]	Superseded by IAPETUS_2010, based on more accurate information in RIIC15
IO_2000	112	Io	This is the reference ORM for Io (a satellite of Jupiter).	2000 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table II, "Io"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Io, Global	SPHERE	IO_2000	[RIIC, Table II, "Io"]	Superseded by IO_1998 (date corrected) based on more accurate information in RIIC15
JANUS_1988	116	Janus	JANUS_1988.	1988 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table II, "Janus"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Janus, Global	TRI_AXIAL-_ELLIPSOID	JANUS_1988	[RIIC, Table II, "Janus"]	Superseded by JANUS_2013, based on more accurate information in RIIC15

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
MIMAS_1994	150	Mimas	This is the reference ORM for Mimas (a satellite of Saturn).	1994 The *x*-positive *xz*-half-plane as determined by an observable fixed surface feature and approximated by an ephemeris as specified in {Table II, "Mimas"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Mimas, Global	SPHERE	MIMAS_1994	[RIIC, Table II, "Mimas"]	Superseded by MIMAS_2010, based on more accurate information in RIIC15
PAN_1991	181	Pan	This is the reference ORM for Pan (a satellite of Saturn).	1991 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table II, "Pan"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Pan, Global	SPHERE	PAN_1991	[RIIC, Table II, "Pan"]	Superseded by PAN_2013, based on more accurate information in RIIC15
PANDORA_1988	182	Pandora	This is the reference ORM for Pandora (a satellite of Saturn).	1988 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table II, "Pandora"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Pandora, Global	TRI_AXIAL-_ELLIPSOID	PANDORA_1988	[RIIC, Table II, "Pandora"]	Superseded by PANDORA_2013, based on more accurate information in RIIC15

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
PHOBOS_1988	183	Phobos	This is the reference ORM for Phobos (a satellite of Mars).	1988 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table II, "Phobos"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Phobos, Global	TRI_AXIAL-_ELLIPSOID	PHOBOS_1988	[RIIC, Table II, "Phobos"]	Superseded by PHOBOS_2010, based on more accurate information in RIIC15
PHOEBE_1988	184	Phoebe	This is the reference ORM for Phoebe (a satellite of Saturn).	1988 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table II, "Phoebe"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Phoebe, Global	SPHERE	PHOEBE_1988	[RIIC, Table II, "Phoebe"]	Superseded by PHOEBE_2010, based on more accurate information in RIIC15
PROMETHEUS-_1988	193	Prometheus	This is the reference ORM for Prometheus (a satellite of Saturn).	1988 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table II, "Prometheus"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Prome-theus, Global	TRI_AXIAL-_ELLIPSOID	PROMETHEUS-_1988	[RIIC, Table II, "Prome-theus"]	Superseded by PROMETHEUS_2013, based on more accurate information in RIIC15

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
RHEA_1988	204	Rhea	This is the reference ORM for Rhea (a satellite of Saturn).	1988 The *x*-positive *xz*-half-plane as determined by an observable fixed surface feature and approximated by an ephemeris as specified in {Table II, "Rhea"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Rhea, Global	SPHERE	RHEA_1988	[RIIC, Table II, "Rhea"]	Superseded by RHEA_2010, based on more accurate information in RIIC15
TELESTO_1988	225	Telesto	This is the reference ORM for Telesto (a satellite of Saturn).	1988 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table II, "Telesto"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Telesto, Global	TRI_AXIAL-_ELLIPSOID	TELESTO_1988	[RIIC, Table II, "Telesto"]	Superseded by TELESTO_2013, based on more accurate information in RIIC15

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
TETHYS_1991	227	Tethys	This is the reference ORM for Tethys (a satellite of Saturn).	1991 The *x*-positive *xz*-half-plane as determined by an observable fixed surface feature and approximated by an ephemeris as specified in {Table II, "Tethys"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Tethys, Global	SPHERE	TETHYS_1991	[RIIC, Table II, "Tethys"]	Superseded by TETHYS_2010, based on more accurate information in RIIC15
TITAN_1982	231	Titan	This is the reference ORM for Titan (a satellite of Saturn).	1982 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table II, "Titan"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Titan, Global	SPHERE	TITAN_1982	[RIIC, Table II, "Titan"]	Superseded by TITAN_2010, based on more accurate information in RIIC15

Table J.17 — Deprecated object-fixed satellite RTs

ORM label	RT label	RT code	RT region	STT label and parameter values	Date published	References	Notes
ATLAS_1988	ATLAS_1988_IDENTITY	32	Global (Atlas)	The reference ORM for object Atlas. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1988	[RIIC, Table II, "Atlas"]	Superseded by ATLAS_2013, based on more accurate information in RIIC15

ORM label	RT label	RT code	RT region	STT label and parameter values	Date published	References	Notes
CALLISTO_2000	CALLISTO_2000-_IDENTITY	46	Global (Callisto)	The reference ORM for object Callisto. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	2000	[RIIC, Table II, "Callisto"]	Superseded by CALLISTO_2001, based on more accurate information in RIIC15
CALYPSO_1988	CALYPSO_1988-_IDENTITY	47	Global (Calypso)	The reference ORM for object Calypso. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1988	[RIIC, Table II, "Calypso"]	Superseded by CALYPSO_2013, based on more accurate information in RIIC15
CHARON_1991	CHARON_1991-_IDENTITY	54	Global (Charon)	The reference ORM for object Charon. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1991	[RIIC, Table II, "Charon"]	Superseded by CHARON_2017, based on more accurate information in RIIC15
DEIMOS_1988	DEIMOS_1988_IDENTITY	63	Global (Deimos)	The reference ORM for object Deimos. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1988	[RIIC, Table II, "Deimos"]	Superseded by DEIMOS_1993, based on more accurate information in RIIC15
DIONE_1982	DIONE_2010_IDENTITY	66	Global (Dione)	The reference ORM for object Dione. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1982	[RIIC, Table II, "Dione"]	Superseded by DIONE_2010, based on more accurate information in RIIC15

ORM label	RT label	RT code	RT region	STT label and parameter values	Date published	References	Notes
ENCELADUS-_1994	ENCELADUS_1994-_IDENTITY	72	Global (Enceladus)	The reference ORM for object Enceladus. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1994	[RIIC, Table II, "Enceladus"]	Superseded by ENCELADUS_2006, based on more accurate information in RIIC15
EPIMETHEUS-_1988	EPIMETHEUS_1988-_IDENTITY	73	Global (Epimetheus)	The reference ORM for object Epimetheus. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1988	[RIIC, Table II, "Epime-theus"]	Superseded by EPIMETHEUS_2013, based on more accurate information in RIIC15
EUROPA_2000	EUROPA_2000-_IDENTITY	77	Global (Europa)	The reference ORM for object Europa. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	2000	[RIIC, Table II, "Europa"]	Superseded by EUROPA_2007, based on more accurate information in RIIC15
GANYMEDE-_2000	GANYMEDE_2000-_IDENTITY	100	Global (Ganymede)	The reference ORM for object Ganymede. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	2000	[RIIC, Table II, "Ganymede"]	Superseded by GANYMEDE_2007, based on more accurate information in RIIC15
HELENE_1992	HELENE_1992_IDENTITY	121	Global (Helene)	The reference ORM for object Helene. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1992	[RIIC, Table II, "Helene"]	Superseded by HELENE_2013, based on more accurate information in RIIC15
IAPETUS_1988	IAPETUS_1988-_IDENTITY	127	Global (Iapetus)	The reference ORM for object Iapetus. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1988	[RIIC, Table II, "Iapetus"]	Superseded by IAPETUS_2010, based on more accurate information in RIIC15

ORM label	RT label	RT code	RT region	STT label and parameter values	Date published	References	Notes
IO_2000	IO_2000_IDENTITY	139	Global (Io)	The reference ORM for object Io. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	2000	[RIIC, Table II, "Io"]	Superseded by IO_1998 (date corrected) based on more accurate information in RIIC15
JANUS_1988	JANUS_1988_IDENTITY	144	Global (Janus)	IDENTITY The reference ORM for object Janus.	2000	[RIIC, Table II, "Janus"]	Superseded by JANUS_2013, based on more accurate information in RIIC15
MIMAS_1994	MIMAS_1994_IDENTITY	173	Global (Mimas)	The reference ORM for object Mimas. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1994	[RIIC, Table II, " Mimas"]	Superseded by MIMAS_2010, based on more accurate information in RIIC15
PAN_1991	PAN_1991_IDENTITY	243	Global (Pan)	The reference ORM for object Pan. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1991	[RIIC, Table II, " Pan"]	Superseded by PAN_2013, based on more accurate information in RIIC15
PANDORA-_1988	PANDORA_1988_IDENTITY	244	Global (Pandora)	The reference ORM for object Pandora. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1988	[RIIC, Table II, " Pandora"]	Superseded by PANDORA_2013, based on more accurate information in RIIC15
PHOBOS_1988	PHOBOS_1988_IDENTITY	245	Global (Phobos)	The reference ORM for object Phobos. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1988	[RIIC, Table II, " Phobos"]	Superseded by PHOBOS_2010, based on more accurate information in RIIC15

ORM label	RT label	RT code	RT region	STT label and parameter values	Date published	References	Notes
PHOEBE_1988	PHOEBE_2006_IDENTITY	246	Global (Phoebe)	The reference ORM for object Phoebe. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1988	[RIIC, Table II, " Phoebe"]	Superseded by PHOEBE_2010, based on more accurate information in RIIC15
PROMETHEUS-_1988	PROMETHEUS_1988-_IDENTITY	254	Global (Prometheus)	The reference ORM for object Prometheus. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1988	[RIIC, Table II, " Prome-theus"]	Superseded by PROMETHEUS_2013, based on more accurate information in RIIC15
RHEA_1988	RHEA_1988_IDENTITY	274	Global (Rhea)	The reference ORM for object Rhea. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1988	[RIIC, Table II, " Rhea"]	Superseded by RHEA_2010, based on more accurate information in RIIC15
TELESTO_1988	TELESTO_1988_IDENTITY	313	Global (Telesto)	The reference ORM for object Telesto. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1988	[RIIC, Table II, " Telesto"]	Superseded by TELESTO_2013, based on more accurate information in RIIC15
TETHYS_1991	TETHYS_1991_IDENTITY	315	Global (Tethys)	The reference ORM for object Tethys. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1991	[RIIC, Table II, " Tethys"]	Superseded by TETHYS_2010, based on more accurate information in RIIC15
TITAN_1982	TITAN_1982_IDENTITY	320	Global (Titan)	The reference ORM for object Titan. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1982	[RIIC, Table II, "Titan"]	Superseded by TITAN_2010, based on more accurate information in RIIC15

Table J.18 — Deprecated dynamic satellite ORMs

In this International Standard, no dynamic satellite ORMs are deprecated, therefore the table is empty.

Table J.19 — Deprecated time-fixed instances of dynamic satellite ORMs

In this International Standard, no time-fixed instances of dynamic satellite ORMs are deprecated, therefore the table is empty.

Table J.20 — Deprecated object-fixed stellar ORMs

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References	Notes
SUN_1992	222	Sun	This is the reference ORM for the Sun (a star).	1992 The *x*-positive *xz*-half-plane as determined by an ephemeris as specified in {Table 1, "Sun"}, with its associated accuracy as specified in {Section 2, paragraph 5}.	Sun, Global	SPHERE	SUN_1992	[RIIC, Table I, "Sun"]	Superseded by SUN_2008, based on more accurate information in RIIC15

Table J.21 — Deprecated object-fixed stellar RTs

ORM label	RT label	RT code	RT region	STT label and parameter values	Date published	References	Notes
SUN_1992	SUN_1992_IDENTITY	310	Global (Sun)	The reference ORM for object Sun. $\Delta x = \Delta y = \Delta z = 0$, $\omega_1 = \omega_2 = \omega_3 = 0''$, $\Delta s = 0$.	1992	[RIIC, Table I, "Sun"]	Superseded by SUN_2008, based on more accurate information in RIIC15

Table J.22 — Deprecated dynamic stellar ORMs

In this International Standard, no dynamic stellar ORMs are deprecated, therefore the table is empty.

Table J.23 — Deprecated time-fixed instances of dynamic stellar ORMs

In this International Standard, no time-fixed instances of dynamic stellar ORMs are deprecated, therefore the table is empty.

J.4 DSSs

This sub-annex presents the specifications of deprecated DSSs. DSS specification elements are defined in Table 9.1. The DSS entries in Table J.24 are grouped by celestial object type and then ordered alphabetically by their label.

Table J.24 — Deprecated DSSs

Object type: Earth			
DSS label	NGVD_1929	**DSS code**	6
Description	N_AM_1927, National Geodetic Vertical Datum (NGVD) 1929	**Global/Local**	Local
Model	none	**References**	[NAVD88, "History of U.S. National Geodetic Vertical Datums" and "Analyses of NGVD 29 General Adjustment"]
Notes	1) A fixed reference for elevations derived from a general adjustment in 1929 of the first-order leveling nets of both the United States and Canada. In the adjustment, mean sea level was held fixed as observed at 21 tide stations in the United States and 5 in Canada. 2) Superseded by NAVD_1988, based the improved accuracy that it provides for North America.		
Object type: Planet (non-Earth)			
Object type: Satellite			
Object type: Sun			