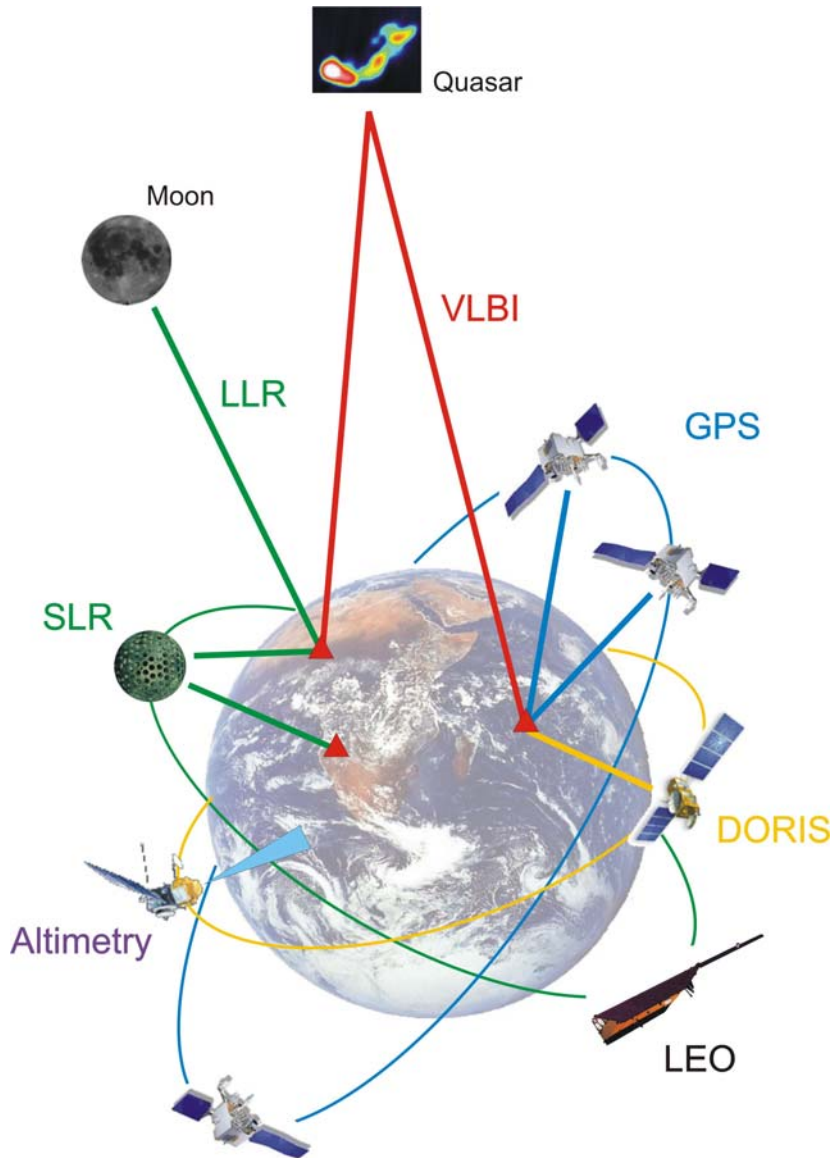




Proposal for Extended Parameterization in SINEX

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More flexibility is needed in the SINEX format (e.g. GGOS-D, combination of troposphere parameters, subdaily resolu.)

Proposal 1:

- A simple, but not elegant extension of the parameter space to allow for a piece-wise linear representation
- Additional names of parameters defined (somewhat confusing)

Proposal 2:

- Generic and flexible naming of parameters concerning different representations, easy to interpret
- Flexibility to go for other parameterizations in the future (e.g. cubic splines, polynomials of higher degree, ...)
- Generic transformation into software code

Proposal 2: Parameter Naming



Examples: **STA0_X** (station coord. x-comp. as constant offset)

TRO0DN (troposphere north gradient as piece-wise linear)

- **Character 1-3: Parameter group** (station coordinates, pole, UT/LOD, nutation, troposphere, satellite orbits, radio sources, geocenter coordinates, potential coefficients, biases, antennas, ...)
- **Character 4:** Distinction between **offsets and rates** (could be extended, if necessary)
 - 0 = Offset
 - 1 = Rate
- **Character 5:** Distinction between different **parameter representations**
 - _ = Constant offset
 - D = Offsets of a piece-wise linear, contin. repres.
 - P = Nodes of a polygon
 - S = Spline representation
- **Character 6:** Distinction of the **component** (e.g. x/y/z, north/east/up, right ascension/declination, cosine/sine, ...)

SINEX Extension: More Flexible Parameterizations

PROPOSAL 1

(November 8, 2007)

<i>Parameter Type</i>	<i>Offset (constant or with rate)</i>	<i>Rate (constant)</i>	<i>Offset as piece-wise linear continuous function (polygon) = new</i>
X-Pole	XPO [mas]	XPOR [mas/d]	XPOP [mas]
Y-Pole	YPO [mas]	YPOR [mas/d]	YPOP [mas]
UT1-UTC	UT [ms]	LOD [ms]	UTP [ms]
Nutation $\Delta\epsilon$	NUT_OB [mas]	NUTROB [mas/d]	NUTPOB [mas]
Nutation $\Delta\psi$	NUT_LN [mas]	NUTRLN [mas/d]	NUTPLN [mas]
Nutation ΔX	NUT_X [mas]	NUTR_X [mas/d]	NUTP_X [mas]
Nutation ΔY	NUT_Y [mas]	NUTR_Y [mas/d]	NUTP_Y [mas]
Trop. ZD (total)	TROTOT [m]	TROTOD [m/d]	TROTOP [m]
Trop. Gradient NS (total)	TGNTOT [m]	TGNTOD [m/d]	TGNTOP [m]
Trop. Gradient EW (total)	TGETOT [m]	TGETOD [m/d]	TGETOP [m]
Trop. ZD (dry)	TRODRY [m]	TRODRD [m/d]	TRODRP [m]
Trop. Gradient NS (dry)	TGNDRY [m]	TGNDRD [m/d]	TGNDRP [m]
Trop. Gradient EW (dry)	TGEDRY [m]	TGEDRD [m/d]	TGEDRP [m]
Trop. ZD (wet)	TROWET [m]	TROWED [m/d]	TROWEP [m]
Trop. Gradient NS (wet)	TGNWET [m]	TGNWED [m/d]	TGNWEP [m]
Trop. Gradient EW (wet)	TGEWET [m]	TGEWED [m/d]	TGEWEP [m]

Remarks:

- This is a proposal that tries to minimize the changes (compared to proposal 2). Only the piece-wise linear representation is added.

SINEX Extension: More Flexible Parameterizations

PROPOSAL 2

(November 8, 2007)

New Definition of 6-Character Parameter Codes:

Character 1-3: Parameter group (station coordinates, pole, UT/LOD, nutation, troposphere, satellite orbits, radio sources, geocenter coordinates, potential coefficients, biases, antennas, ...)

Character 4: Distinction between offsets and rates (could be extended, if necessary)

0 = Offset

1 = Rate

Character 5: Distinction between different parameter representations

_ = Constant offset

D = Offsets of a piece-wise linear, continuous representation

P = Nodes of a polygon

S = Spline representation

Character 6: Distinction of the component

(e.g. x/y/z, north/east/up, right ascension/declination, cosine/sine, ...)

<i>Parameter Type</i>	<i>Old name</i>	<i>Char. 1-3</i>	<i>Char. 4</i>	<i>Char. 5</i>	<i>Char. 6</i>
Station X coordinate	STAX	STA	0	_ / D / P / S	X
Station Y coordinate	STAY		0		Y
Station Z coordinate	STAZ		0		Z
Station X velocity	VELX		1		X
Station Y velocity	VELY		1		Y
Station Z velocity	VELZ		1		Z
Geocenter X coordinate	XGC	GEO	0		X
Geocenter Y coordinate	YGC		0		Y
Geocenter Z coordinate	ZGC		0		Z
Radio source right ascension	RS_RA	RDS	0		R
Radio source declination	RS_DE		0		D
Radio source right ascension rate	RS_RAR		1		R
Radio source declination rate	RS_DER		1		D
Radio source parallax	RS_PL		0		P
Delta time UT1-UTC	UT	UTL	0		U
Length of day	LOD		1		L
X polar motion	XPO	POL	0		X
Y polar motion	YPO		0		Y

<i>Parameter Type</i>	<i>Old name</i>	<i>Char. 1-3</i>	<i>Char. 4</i>	<i>Char. 5</i>	<i>Char. 6</i>
X polar motion rate	XPOR		1		X
Y polar motion rate	YPOR		1		Y
Nutation in longitude	NUT_LN	NUT	0		L
Nutation in obliquity	NUT_OB		0		O
Nutation rate in longitude	NUTRLN		1		L
Nutation rate in obliquity	NUTROB		1		O
Nutation angle X	NUT_X		0		X
Nutation angle Y	NUT_Y		0		Y
Rate for nutation angle X	NUTR_X		1		X
Rate for nutation angle Y	NUTR_Y		1		Y
Satellite X coordinate	SAT__X	SAT	0		X
Satellite Y coordinate	SAT__Y		0		Y
Satellite Z coordinate	SAT__Z		0		Z
Satellite X velocity	SAT_VX		1		X
Satellite Y velocity	SAT_VY		1		Y
Satellite Z velocity	SAT_VZ		1		Z
Radiation pressure	SAT_RP		0		P
GX scale	SAT_GX		0		1
GZ scale	SAT_GZ		0		2
GY bias	SATYBI		0		B
Troposphere zenith delay (total)	TROTOT	TRO	0		Z
Troposphere gradient north (total)	TGNTOT		0		N
Troposphere gradient east (total)	TGETOT		0		E
Troposphere zenith delay (dry part)	TRODRY	TRD	0		Z
Troposphere gradient north (dry)	TGNDRY		0		N
Troposphere gradient east (dry)	TGEDRY		0		E
Troposphere zenith delay (wet part)	TROWET	TRW	0		Z
Troposphere gradient north (wet)	TGNWET		0		N
Troposphere gradient east (wet)	TGEWET		0		E
Range bias	RBIAS	BIA	0		R
Time bias	TBIAS		0		T
Scale bias	SBIAS		0		S
Troposphere bias at zenith	ZBIAS		0		Z
VLBI antenna axis offset	AXI_OF	ANT	0		O
Satellite antenna X offset	SATA_X		0		X

<i>Parameter Type</i>	<i>Old name</i>	<i>Char. 1-3</i>	<i>Char. 4</i>	<i>Char. 5</i>	<i>Char. 6</i>
Satellite antenna Y offset	SATA_Y		0		Y
Satellite antenna Z offset	SATA_Z		0		Z
Spherical harmonic coefficient (Cosine)	CN	POT	0		C
Spherical harmonic coefficient (Sine)	SN		0		S

Remarks:

- This proposal is not just an addition to already existing parameter types. It would be a more consistent nomenclature for the future. The old parameter types could be kept during a long transition period, if needed for backward compatibility.
- Using character 4, offsets as well as rates (and more) can be defined for all parameter groups given above, even if they are not explicitly listed (e.g. for troposphere parameters).
- Using character 5 different parameterizations become possible for all the various parameter groups, even if they are not explicitly listed above.