

The new geometry routines in the ALADIN model

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Translated from French by « Tłumacz »

They are composed of :

- EGGPACK.F90,
- EGGANGLES.F90,
- EGGMRT.F90,

replacing the old ones :

- EGGX.F90,
- EGGMLT.F90,
- EGGDIR.F90,
- EGGRVS.F90.

Nevertheless, some restrictions have been set up :

- projections will be tangent to the globe ($ERPK = \sin(ELAT0)$);
- there will be no rotation of the pole of projection, i.e. options ($NROTEQ > 0$, ELONR, ELATR) are suppressed as well as parameters (ELONR, ELATR) in new « cadre »; NROTEQ is still used in « cadre »;
- the EBETA angle will no longer be used any more, since it is implicitly replaced by the use of ELON0, except for the Mercator projection;
- the « latlon » case is handled outside these routines.

You may not know it, but for a few cycles you are already using the new "EGGX package" (EGGPACK), apart from those still very late. Actually, for compatibility reasons (limited to the above restrictions), the old EGGX is only used by ECHIEN when reading a file which has an old frame (aladiners say « cadre ») (figure1). All other domain definitions and projections use EGGPACK (e.g. MAKDO).

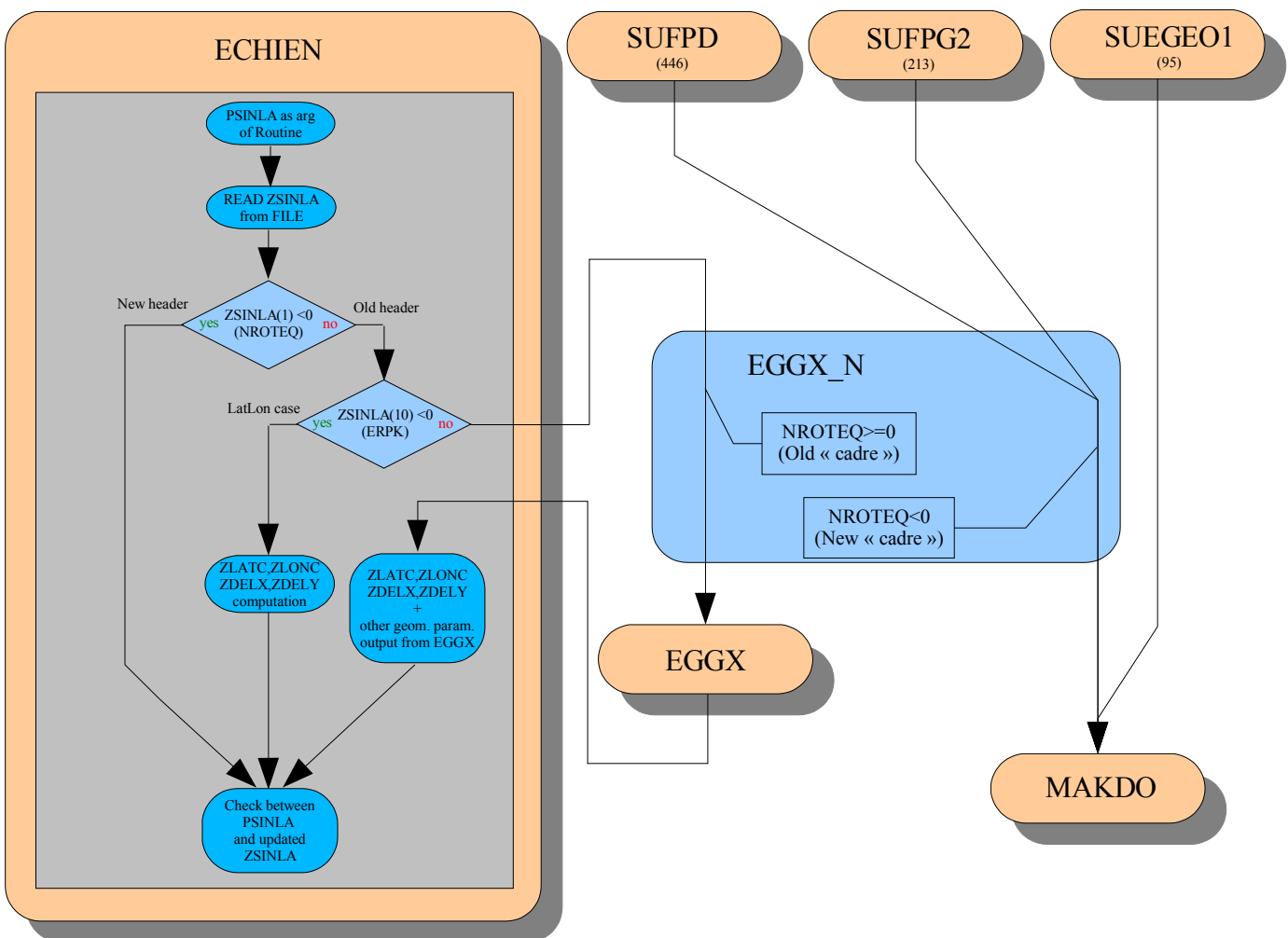


Figure 1 : Calling tree for ALADIN geometry

The first parameter from array ZSINLA (corresponding to NROTEQ) determines whether a file is either from the new or the old geometry. If it is equal to -1 (Lambert/Stereo.Pol/Mercator), or to -2 (Mercator rotated/tilted), then the « cadre » is from the new geometry, otherwise, if equal to 0, it is from the old geometry.

As shown in table 2 and figure 3, the meaning of the ZSINLA parameters is different according to the type of geometry (old or new).

Parameters		Projections :					ZSINLA Index
Model:	FullPos:	LatLon	Lambert	StereoPolar	Mercator	Merc.Rot.Tilt	
LMRT	LFPMRT	(False)	(False)	(False)	(False)	True	-
(NROTEQ)		{-1}	{-1}	{-1}	{-1}	{-2}	1
ERPK	FPRPK	<0	]0,1[	{1}	{0}	{0}	2
ELON0	FPLON0	{0}	] -180,180]	] -180,180]	] -180,180]	] -180,180]	3
ELAT0	FPLAT0	{0}	] -90,90[	{-90,90}	{0}	{0}	4
ELONC	RLONC	] -180,180]	] -180,180]	] -180,180]	] -180,180]	] -180,180]	5
ELATC	RLATC	] -90,90]	] -90,90]	] -90,90]	] -90,90]	] -90,90]	6
EDELX	RDELX	Degrees	Meters	Meters	Meters	Meters	7
EDELY	RDELY	Degrees	Meters	Meters	Meters	Meters	8
(ELX)		Degrees	Meters	Meters	Meters	Meters	9
(ELY)		Degrees	Meters	Meters	Meters	Meters	10
(EXWN)							11
(EYWN)							12
ELON1	RLONW	] -180,180]	] -180,180]	] -180,180]	] -180,180]	] -180,180]	13
ELAT1	RLATS	] -90,90]	] -90,90]	] -90,90]	] -90,90]	] -90,90]	14
ELON2	RLONE	] -180,180]	] -180,180]	] -180,180]	] -180,180]	] -180,180]	15
ELAT2	RLATN	] -90,90]	] -90,90]	] -90,90]	] -90,90]	] -90,90]	16

LMRT	LFPMRT	(False)	(False)	(False)	(False)	(False)	-
(NROTEQ)		{0}	{0}	{0}	{0}	-	1
(PLONR)		{0}	{0}	{0}	{0}	-	2
(PLATR)		{0}	{0}	{0}	{0}	-	3
ELON1	RLONW	] -180,180]	] -180,180]	] -180,180]	] -180,180]	-	4
ELAT1	RLATS	] -90,90]	] -90,90]	] -90,90]	] -90,90]	-	5
ELON2	RLONE	] -180,180]	] -180,180]	] -180,180]	] -180,180]	-	6
ELAT2	RLATN	] -90,90]	] -90,90]	] -90,90]	] -90,90]	-	7
ELON0	FPLON0	{0}	] -180,180]	] -180,180]	] -180,180]	-	8
ELAT0	FPLAT0	{0}	] -90,90[	{-90,90}	{0}	-	9
ERPK	FPRPK	<0	]0,1[	{1}	{0}	-	10
(NSOTRP)		{0}	{0}	{0}	{0}	-	11
(NGIVO)		{0}	{0}	{0}	{0}	-	12
(ELX)		Degrees	Meters	Meters	Meters	-	13
(ELY)		Degrees	Meters	Meters	Meters	-	14
EDELX	RDELX	Degrees	Meters	Meters	Meters	-	15
EDELY	RDELY	Degrees	Meters	Meters	Meters	-	16
(EXWN)						-	17
(EYWN)						-	18

NB: input parameters are in green; to be noted that for NCADFORM=0, ELATC, ELONC are absent despite having been used to create some geometry with the new EGGX (MAKDO). The LMRT/LFPMRT value (false) is the value by default.

Table 2 : Definition intervals and links between « ZSINLA » array and geometrical parameters

For compatibility sake, it is possible, even if the routines used in the model are those of the new EGGX (EGGPACK), to specify a type of « cadre » for FA file (old or new). Key NCADFORM (figures 3 & 4) makes this possible. At this stage, the default value is set at 0, which means that the « cadre » is of the old type. In the future, the default value should be set at 1 (new type of « cadre ») as we will shift to the new geometry in climatological files and the remaining of the suite. In the meantime, NCADFORM = 1 should always be specified so that the « cadre » should be compatible with the new geometry.

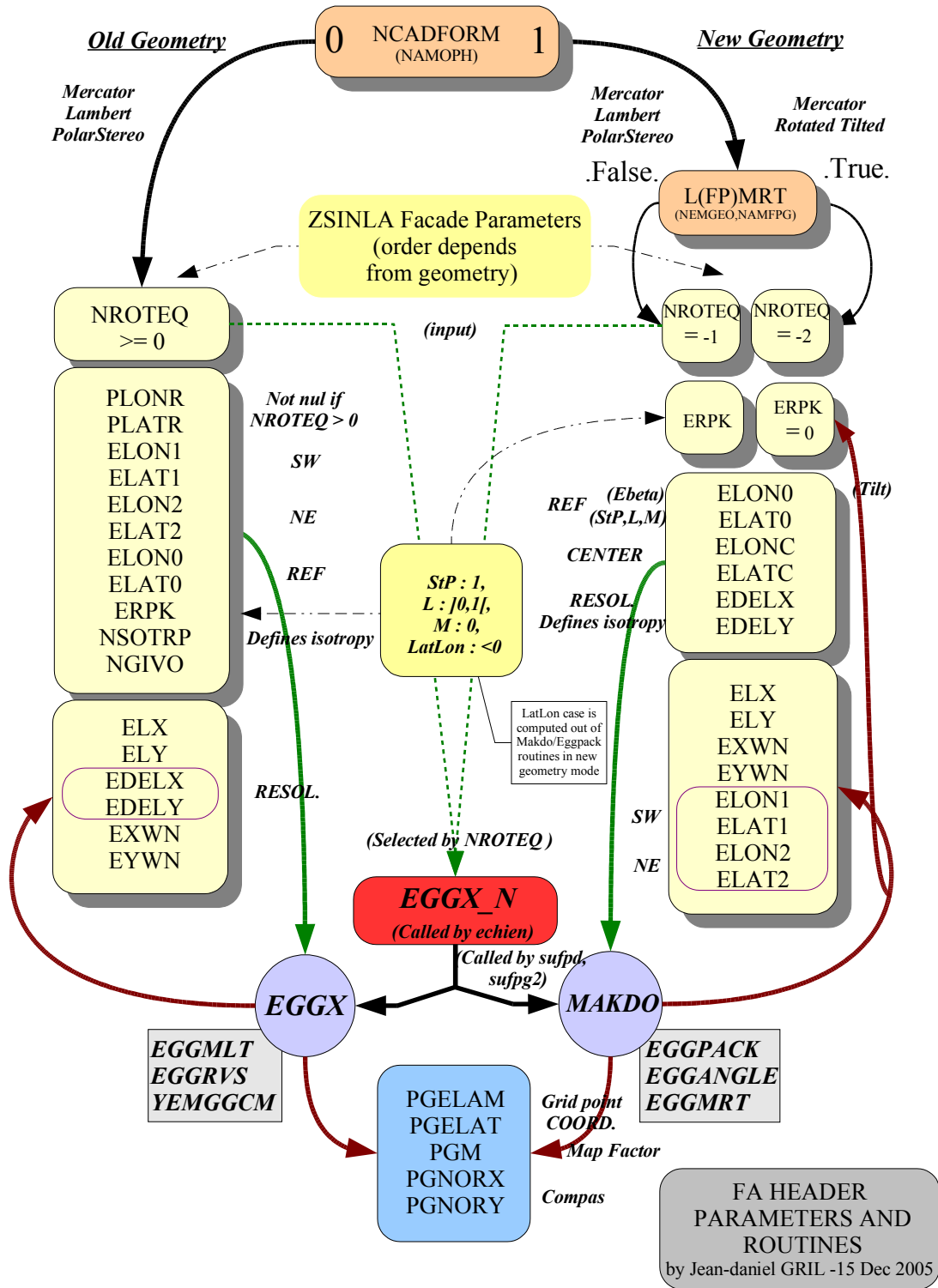


Figure 3 : Meaning of geometrical parameters, read in FA file « cadre » or set up by model

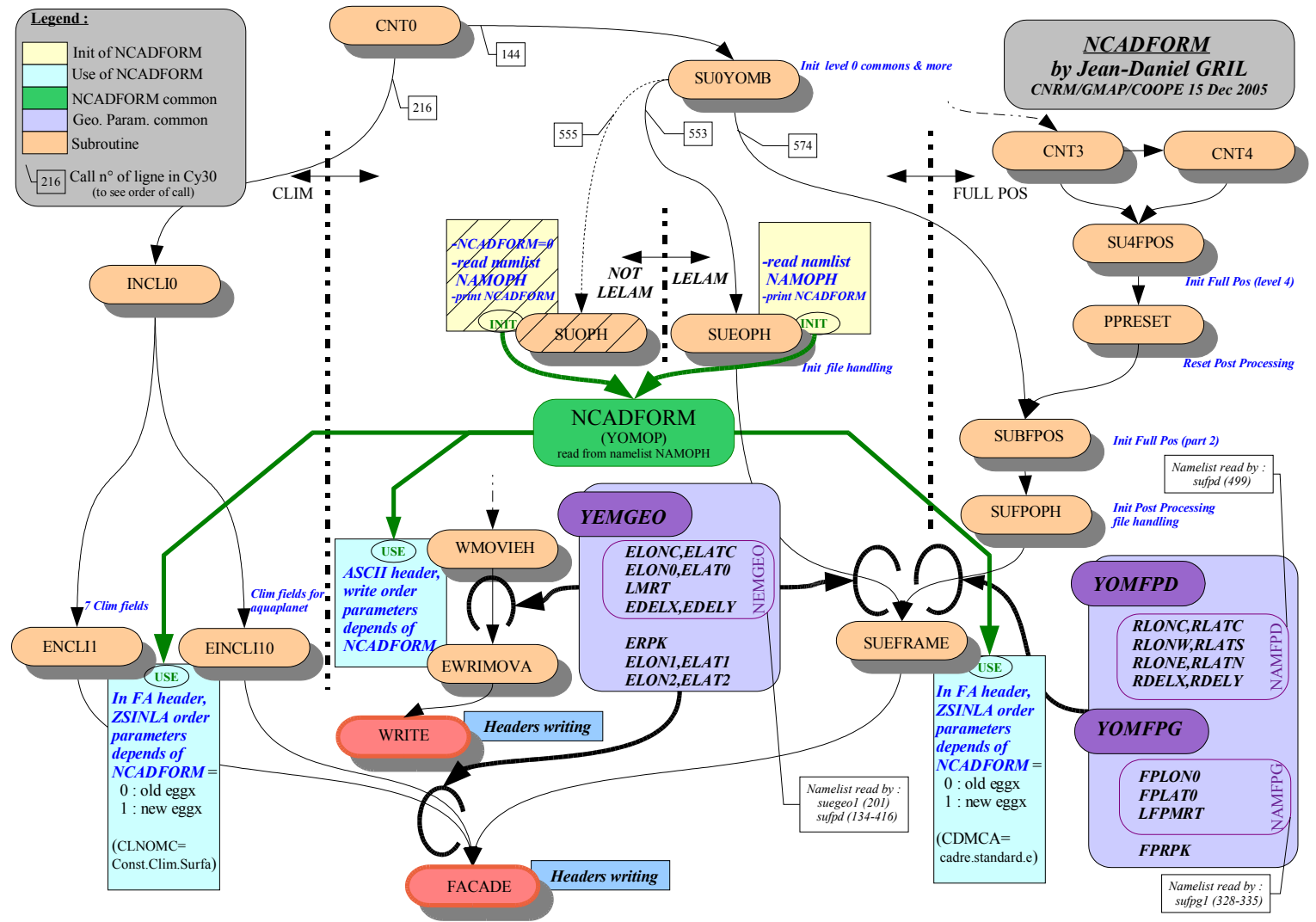


Figure 4 : Dataflow for geometry in the model. Left : e923; Middle : forecast; Right : FullPos/e927 (cy30)

Let me remind you once more that, the management of the « latlon » mode is independent from EGGPACK. One chooses either « latlon » or « projection » mode (see the values of parameters in table 2).

Until cycle 30T1 (incl.), a problem occurred with « latlon ». It will be corrected soon. It has to do with « latlon » climatological files created with ELAT0, ELON0 not explicitly defined in namelist (« latlon » choice should set them at 0°). As a matter of fact, these files have for values 10° and of 60° (values by default). In SUFPG1 (during the FullPos creation of « latlon » coupling files), the equivalent (FPLAT0, FPLON0) parameters are initialized at (ELAT0, ELON0) (which should not generate an error) but, whatever values are read in NAMFPG (if they are specified, which should not be required in « latlon » mode), these values (FPLAT0, FPLON0) are forced to 0° (which is normal for « latlon ») which, in turn, induces an error in ECHIEN (table 5). That is why we had to give you new climatological files with (ELAT0, ELON0) set to 0°.

LELAM	PART	CFPFMT	GAUSS	MODEL	LATLON	LELAM	
FALSE	SETUP	N° LIGNE	132	132	161	187	
		FPLAT0	0	0	0	f(CFPDOM)	
		FPLON0	0	0	0	?	
		FPRPK	-9	-9	-9	F	
		LFPMRT	F	F	F	RDELX	
		FPLX	0	0	0	RDELY	
		FPLY	0	0	0		
	READ NAMFPG namelist at LINE 328						
	CHECK	N° LIGNE	425	349	370	448	
		FPLAT0	0	0	0	(no check)	
		FPLON0	0	0	0		
		FPRPK	-9	?	-9		
		LFPMRT	F	F	F		
		FPLX	0	0	0		
FPLY		0	0	0			
LFMAP	T	T	T				
TRUE	SETUP	N° LIGNE	251	297	274	297	
		FPLAT0	0	ELAT0	ELAT0	ELAT0	
		FPLON0	0	ELON0	ELON0	ELON0	
		FPRPK	-9	?	?	?	
		LFPMRT	F	F	F	F	
		FPLX	0	ELX	ELX	ELX	
		FPLY	0	ELY	ELY	ELY	
	READ NAMFPG namelist at LINE 328						
	CHECK	N° LIGNE	425	403	370	448	
		FPLAT0	0	ELAT0	0	(no check)	
		FPLON0	0	ELON0	0		
		FPRPK	-9	?	-9		
		LFPMRT	F	LMRT	F		
		FPLX	0	ELX	0		
FPLY		0	ELY	0			
LFMAP	T	LMAP	T				

SUFPG1 (cycle 30)

Table 5 : Default setup and parameter check (after namelist has been read), in SUFPG1 (cy30)

Briefly :

- as long as the default value of NCADFORM is not 1, it must be specified when using your programs.
- For security sake for the present time, it is necessary to explicitly define (ELAT0, ELON0) (at 0°) when creating climatological files.
- May I remind you to test your configurations using « cadres » of files FA as well as your side applications using the new geometry before the switch scheduled within the end January 2006.
- Please note that, the WMOVIEH et EWRIMOVA routines are modified so as to take into account the presence of the Mercator Rotated/Tilted geometry.
- WARNING : since cy29T2 (incl.) and until the corrected version 2005.0927 of EGGPACK , an error occurred in Mercator case, in routines LATLON_TO_XY_S (near line 911) and LATLON_TO_XY_V (near line 974)