

Mesoscale numerical weather prediction during T-PARC using COSMO

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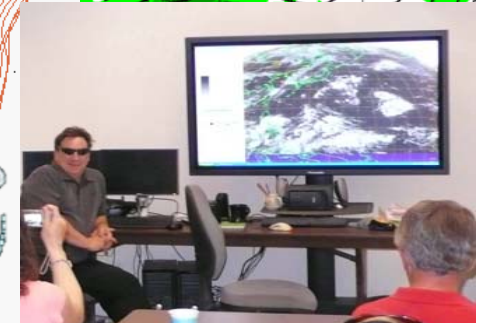
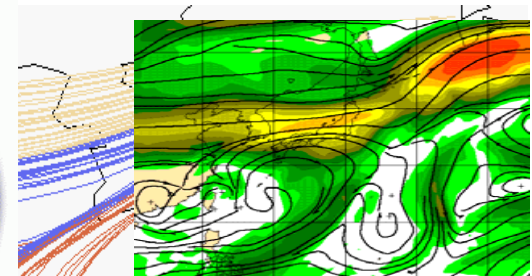
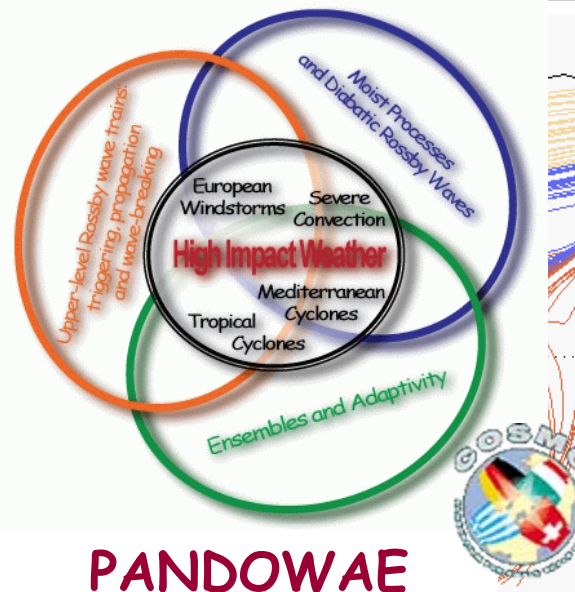
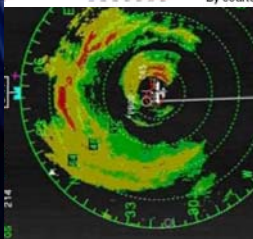
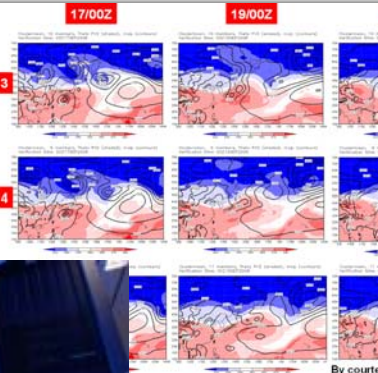


Forschungszentrum Karlsruhe
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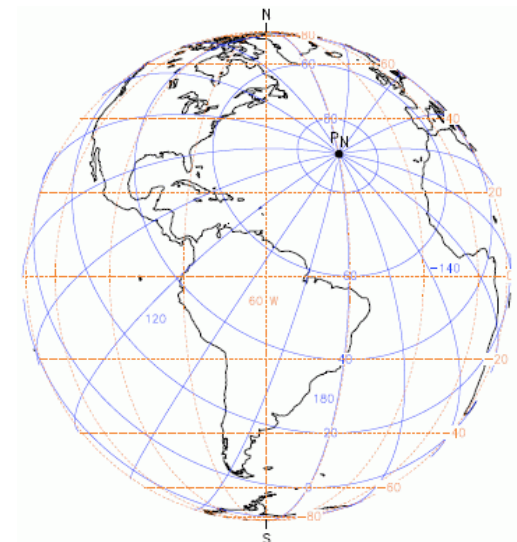
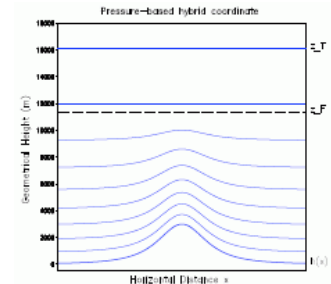
Universität Karlsruhe (TH)
Research University • founded 1825

Institut für Meteorologie und Klimaforschung, Karlsruhe





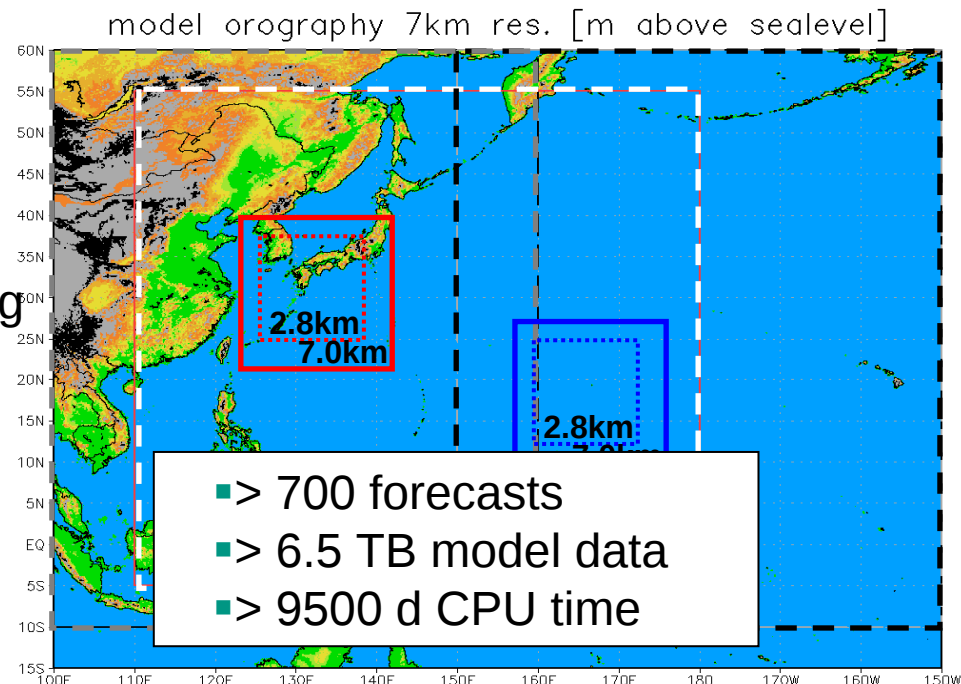
- non-hydrostatic regional numerical weather prediction model
- Version 4.0 used
- GME and ECMWF data as driving global models
- 7km, and 2.8km horizontal resolution
- 51 vertical levels (higher upper boundary)
- standard configuration



Model documentation available at: <http://www.cosmo-model.org>

Steppeler, J., G. Doms, U. Schättler, H.W. Bitzer, A. Gassmann, U. Damrath and G. Gregoric: 2003: Meso-Gamma Scale Forecasts Using the Non-hydrostatic Model LM. *Meteorology and Atmospheric Physics*, 82, 75-90.

- Apart from higher upper boundary standard COSMO version (not tested in the tropics)
- COSMO 4.0 on HP XC4000 at SCC Karlsruhe
 - Up to 16 forecasts per day:
 - 2 driving global models: GME (DWD) and IFS (ECMWF)
 - 2 horizontal resolutions: 0.0625° and 0.025°
 - 2 initial times: 00Z and 12Z
 - 2 domains (flex1, invest)
 - Some runs initialised from forecasts (time-shifted runs)
 - Some manual runs (including Fengshen, Rammasun)
 - 1 Aug 2008 - 20 Oct 2008
 - 72h forecasts with 1hourly output



■ Some numbers of a typical run

dx,dy	dt	nx,ny	x,y	nz	#CPU	CPU-time	duration	data
0.0625°	20-40s	321	20°	51	32-64	~ 72h	1.5-2.5h	~5GB
0.025°	8-16s	601	15°	51	96-144	~ 720h	4.5-6.0h	~16GB

■ Variables available:

pressure level data: (1000hPa to 25hPa with a 25hPa interval)

FI	(profile) geopotential [(m**2)/(s**2)]
OMEGA	(profile) vertical velocity [Pa/s]
QC	(profile) specific cloud water content, grid scale [kg/kg]
QI	(profile) specific cloud ice content, grid scale [kg/kg]
QV	(profile) specific humidity [kg/kg]
T	(profile) temperature [K]
TKE	(profile) turbulent kinetic energy [(m/s)**2]
U	(profile) u-component (zonal) of wind [m/s]
V	(profile) v-component (merdional) of wind [m/s]

■ 2D fields (e.g. cloud properties, surface fluxes, ...)

■ cloud cover on model levels

■ Data access and information at

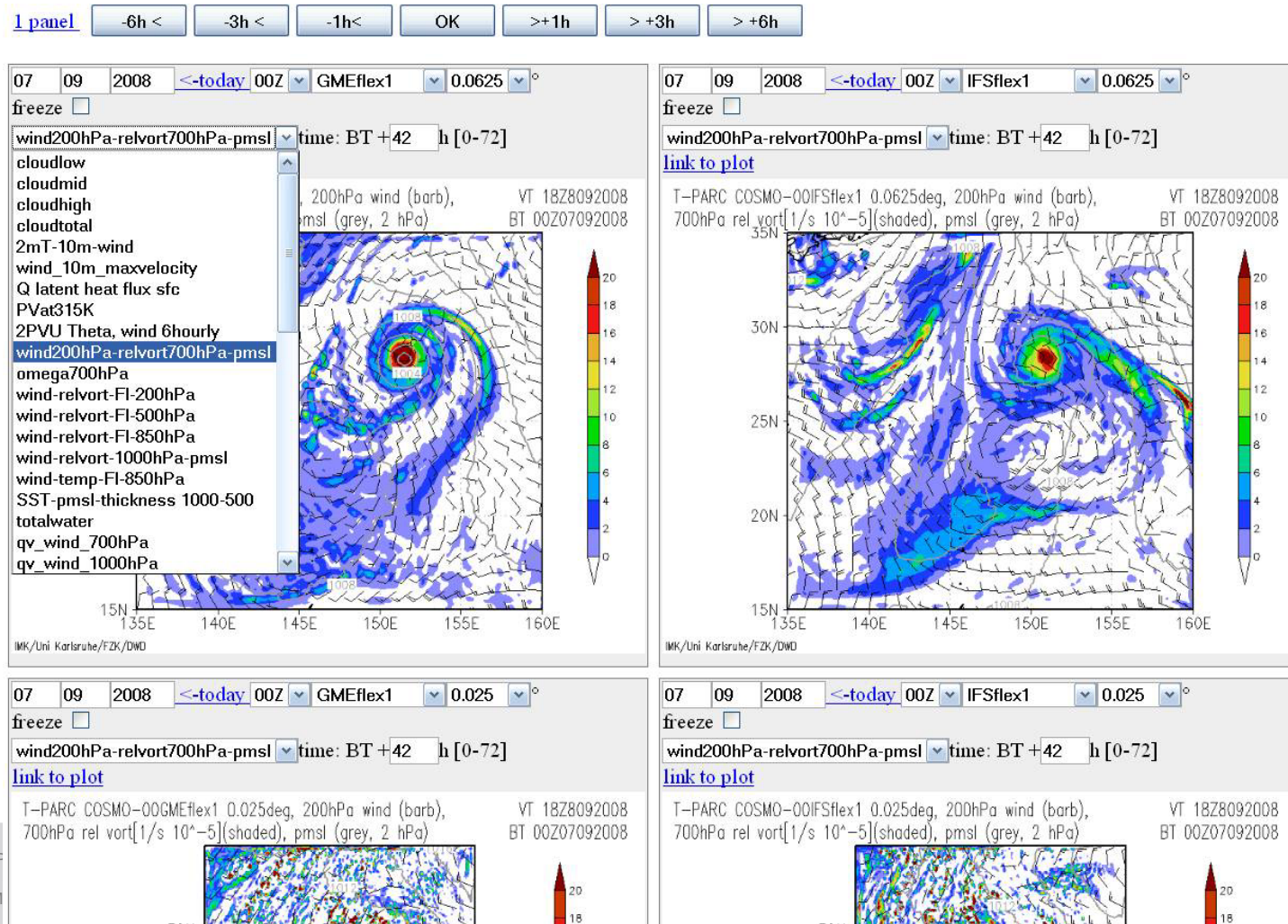
<http://imk-tyne.physik.uni-karlsruhe.de/~christian/PhD/tparc/t-parc.html>

■ Table of runs performed:

20080831	12	135	160	5	25	TCS30	68h	72h	140	159	8	18	63h	72h	120	140	20	40	TCS31	72h	72h											
date	bt	flex1_0.0625° (7.0km)					GME	IFS	flex1_0.025° (2.8km)				GME	IFS	invest_0.0625° (7.0km)					GME	IFS	invest_0.025° (2.8km)				GME	IFS	comf	manual4k			
		lonW	lonE	latS	latN	storm	1/9	3/11	lonW	lonE	latS	latN	5/13	7/15	lonW	lonE	latS	latN	storm	2/10	4/12	lonW	lonE	latS	latN	6/14	8/16			lonW	lonE	
20080901	00	130	155	5	25	TCS30	72h	72h	132	151	6	20	72h	72h	125	145	25	45	TCS31	0	72h											
20080901	12	130	155	5	25	TCS30	72h	72h	132	151	6	20	72h	72h	125	145	25	45	TCS31	72h	72h											
20080902	00	125	150	5	25	TCS30	72h	72h	127	146	6	20	72h	72h	125	145	25	45	TCS31	72h	72h											
20080902	12	125	150	5	25	TCS30	72h	72h	127	146	6	20	72h	0	125	145	25	45	TCS31	72h	72h											
20080903	00	135	162	15	30	TCS33	72h	72h	138	158	16	28	72h	72h	140	165	2	22	TCS35/36	72h	72h	141	160	3	15	72h	?					
20080903	12	135	162	15	30	TCS33	72h	72h	138	158	16	28	72h	72h	140	165	2	22	TCS35/37	72h	72h	141	160	3	15	72h	?			140	165	
20080904	00	149	169	10	30	TCS37	72h	72h	150	166	16	28	72h	72h	125	150	10	30	TCS33	72h	72h									140	165	
20080904	12	149	169	10	30	TCS37	72h	72h	150	166	16	28	72h	72h	125	150	10	30	TCS33	72h	72h									135	160	
20080905	00	140	165	10	30	TCS37	72h	72h	147	164	14	29	72h	72h	125	150	30	50	failed	CFL	CFL											
20080905	12	140	165	10	30	TCS37	72h	72h	147	164	14	29	72h	72h	125	150	30	50	failed	CFL	CFL									135	160	
20080906	00	137	162	15	35	TCS37	72h	72h	143	160	16	31	72h	72h	125	150	30	50	failed	CFL	CFL									135	160	
20080906	12	137	162	15	35	TCS37	72h	72h	143	160	16	31	72h	72h	125	150	30	50	failed	CFL	12h?									140	160	
20080907	00	135	160	15	35	TCS37	72h	72h	144	159	16	34	72h	72h	115	135	10	30	TCS33	72h	72h	118	133	13	28	0	72h			140	160	
20080907	12	135	160	15	35	TCS37	72h	72h	144	159	16	34	72h	72h	115	135	10	30	TCS33	72h	72h	118	133	13	28	0	72h			135	155	
20080908	00	135	160	20	40	TCS37	72h	72h	139	158	22	37	72h	72h	110	135	10	30	TCS33	72h	72h	115	132	12.5	27.5	72h	72h					
20080908	12	135	160	20	40	TCS37	ots, da	72h	139	158	22	37	72h	72h	110	135	10	30	TCS33	72h	72h	115	132	12.5	27.5	72h	72h					
20080909	00	135	160	25	45	TCS37	72h	72h	139	154	26	43	0	0	115	135	14	34	TCS33	72h	72h	CFL				CFL	CFL	invest 7km with				
20080909	12	115	135	14	34	TCS33	72h	72h	117	132	15	30	31h	40h	135	160	25	45	TCS37	72h	72h	139	154	26	43	0	0	CFL				
20080910	00	114	134	12	32	TCS33	72h	72h	115	130	15	29	30h	60h	135	160	25	45	TCS37	72h	72h	137	152	26	43	58h	54h	CFL,flex1 7km w				
20080910	12	114	134	12	32	TCS33	72h	72h	115	130	15	29	17h	20h	135	160	25	45	TCS37	72h	72h	137	152	26	43	55h	59h	CFL,flex1 7km w	115	140		
20080911	00	110	130	14	34	TCS33	72h	72h	113	128	15	30	10h	0	135	160	25	45	TCS37	72h	72h	139	154	29	44	60h	60h			114	139	
20080911	12	110	130	14	34	TCS33	72h	72h	113	128	15	30	10h	13h	135	160	25	45	TCS37	72h	72h	139	154	29	44	0	0			115	140	
20080912	00	110	130	14	34	TCS33/TY Sinlaka	72h	72h	113	128	15	30	2h	0																117	142	
20080912	12	110	130	14	34	TCS33/TY Sinlaka	72h	72h	113	128	15	30	0	0																		
20080913	00	110	130	20	40	TCS33/TY Sinlaka	72h	72h	114	129	21	36	0	0	140	160	14	34	TCS43	72h	72h	145	159	15	25	60h	60h					
20080913	12	110	130	20	40	TCS33/TY Sinlaka	72h	72h	114	129	21	36	0	0	140	160	14	34	TCS43	72h	72h	145	159	15	25	0	60h			122	147	

- Some model products in T-PARC field catalogue
- All model products available in “Data Browser”

<http://imk-tyne.physik.uni-karlsruhe.de/~christian/PhD/tparc/t-parc.html>



- Raw data (GRIB1) archived for 5 years at IMK, Karlsruhe
- COSMO forecasts available for almost all TCS/T-PARC systems between 1 Aug 2008 and 20 Oct 2008
- Model products in T-PARC field catalogue (selected) and on COSMO-T-PARC webpage (all)

If COSMO data is needed visit

<http://imk-tyne.physik.uni-karlsruhe.de/~christian/PhD/tparc/t-parc.html>

or contact

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