Regional Cooperation for
Limited Area Modeling in Central Europe

LACE
nwp central europe

Data assimilation status at DHMZ

DAWD 18-20.09.2019.

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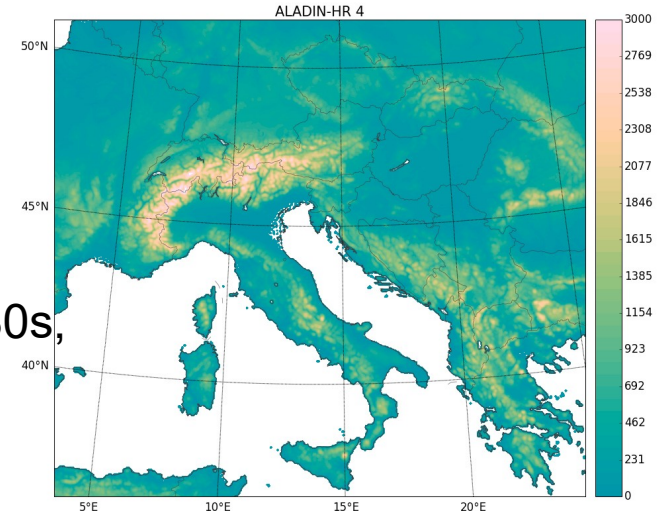
DHMZ SHMU ARSO METEO Slovenia OMSZ ZAMG ROMANIA ANM

ALADIN-HR4 data assimilation



- ALARO-0 (cy38t1)
  - Domain: Δx=4km, 73 vertical level, time step 180s, 432x480 GP, quadratic trunc.
  - 3h space consistent coupling
  - lagged LBC from ECMWF
  - 00, 06, 12 and 18 UTC +72h forecast
  - DFI initialization
- Upper air analysis
  - 3DVar (cy38t1)
  - 3h cycle no DFI
  - NMC B matrix (tests with EDA B)
  - VarBC – 3h cycling; REDNMC=1.4
  - Assimilated observations – SYNOP,(Ps), TEMP(T, q, u, v), AMDAR(T, u, v), AMV, SEVIRI (ch 2,3), Mode-S MRAR SI
- Surface analysis
  - OI based on SYNOP (T2m, RH2m)
  - MESCAN correlation function

DA activities at DHMZ

- DA in cycle 43 (ongoing)
  - BATOR – technical test OK
  - Further tests planned until the end of the year
- GNSS ZTD assimilation
  - obtained access to EGVAP data
  - work is planned to start in October 2019
- MODE-S MRAR
  - Received first data sample from Croatia Control; Quality check of data ongoing
- Jk in ALADIN-HR4
  - Work planned in following months
- Radar data assimilation
  - No resources available in this year

MODE-S MRAR

- Only daily files available once per day (00.01 for day before) – not suited for operations
- Permission to share via OPLACE
- First analysis of data availability was done for data sample: 2019.07.03. - 2019.08.27.
  - Formatting errors – mainly different number of columns

MODE-S MRAR

Date	Time	Sensor	Callsign	ARCID	latitude	longitude	flight_level	windspeed_kt	winddirection_deg	staticairtemp_C	staticairpressure_hPa	turbulence	humidity
2019-07-29	00:00:05	PSU	ASL38Z	4C016F	44.331448	20.767160	132.25	NaN	NaN	-2.00	NaN	NaN	NaN
2019-07-29	00:00:05	PSU	ASL16V	4C016D	44.457895	20.620607	101.00	NaN	NaN	2.75	NaN	NaN	NaN
2019-07-29	00:00:30	PSU	ASL38Z	4C016F	44.311700	20.782751	134.75	NaN	NaN	-2.50	NaN	NaN	NaN
2019-07-29	00:00:30	PSU	ASL16V	4C016D	44.437462	20.636145	104.00	NaN	NaN	2.25	NaN	NaN	NaN

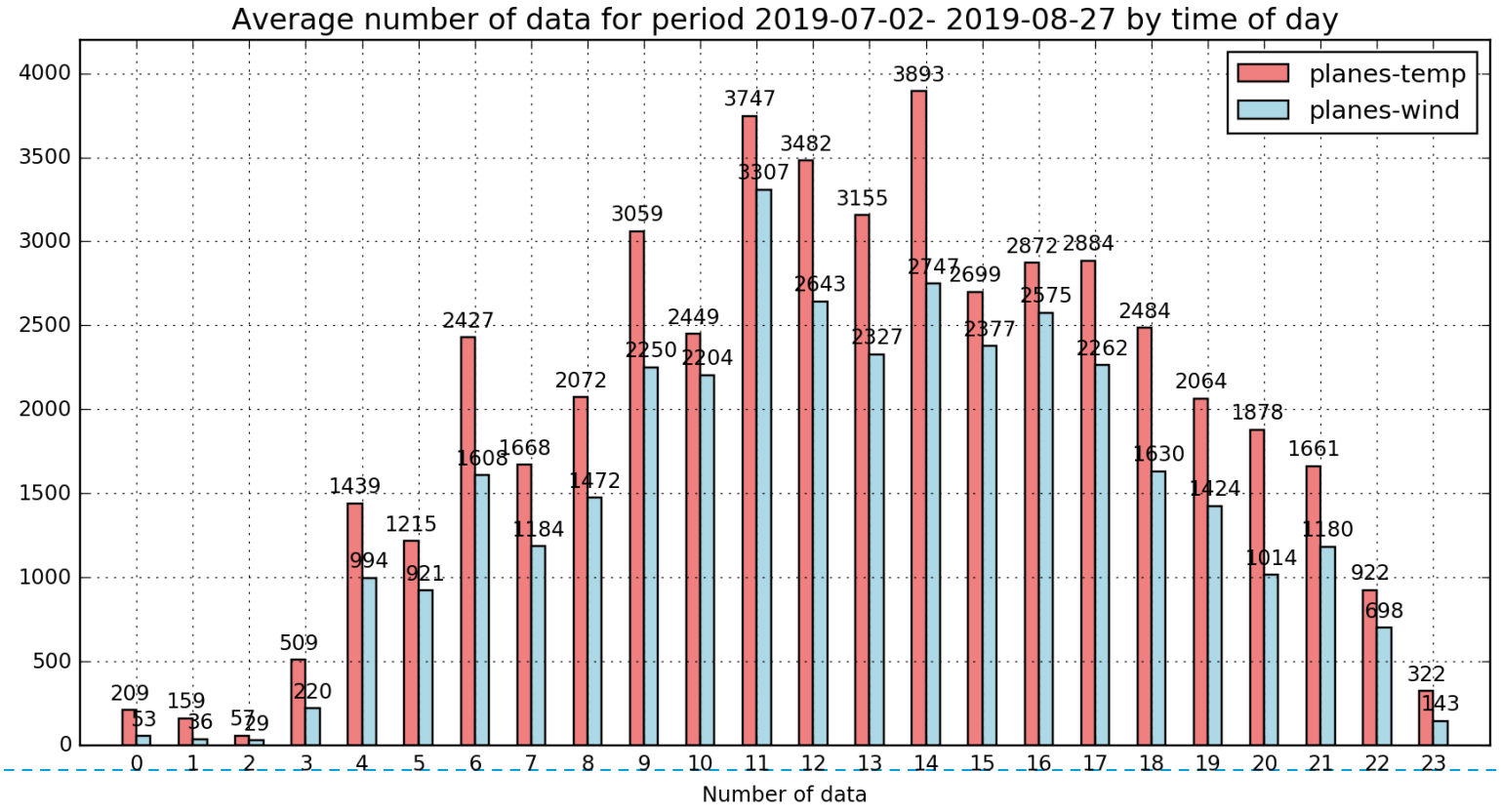
- Compared to Slovenian MRAR data “S_RollAngle” and “S_GroundSpeed” are missing – important for QC
- Sampling frequency not constant

2019-07-29;02:31:38;PSU;SWT6812;3442D4;48.043765;14.896517;190.00;;;-10.0;;;
2019-07-29;02:32:28;PSU;SWT6812;3442D4;48.016818;14.973840;190.00;;;-10.25;;;
2019-07-29;02:36:25;PSU;SWT6812;3442D4;47.886835;15.348423;190.00;;;-10.25;;;
2019-07-29;02:37:29;PSU;SWT6812;3442D4;47.850848;15.446375;190.00;;;-10.0;;;
2019-07-29;02:37:54;PSU;SWT6812;3442D4;47.837876;15.487270;190.00;;;-10.0;;;

2019-07-29;19:19:13;MKP;ADR40J;506C1A;46.260074;14.142922;124.00;5.00;12.66;2.0;;;
2019-07-29;19:19:13;PLE;ADR40J;506C1A;46.259174;14.145019;124.00;6.00;14.77;2.0;;;
2019-07-29;19:19:30;PSU;ADR40J;506C1A;46.243800;14.175579;119.00;5.00;6.33;3.25;;;
2019-07-29;19:19:33;MKP;ADR40J;506C1A;46.242285;14.179972;118.25;5.00;7.03;3.25;;;
2019-07-29;19:19:38;MKP;ADR40J;506C1A;46.237945;14.190294;116.75;5.00;9.14;3.0;;;
2019-07-29;19:19:55;PSU;ADR40J;506C1A;46.224243;14.220390;111.50;7.00;33.05;4.0;;;
2019-07-29;19:19:57;MKP;ADR40J;506C1A;46.221720;14.222748;110.50;8.00;36.56;4.25;;;
2019-07-29;19:19:58;PLE;ADR40J;506C1A;46.218320;14.223040;110.50;8.00;36.56;4.25;;;

MODE-S MRAR

- QC
  - discard temperature >45°C and <85°C
  - Discard wind > 200knt
  - ~0.4 % of data



Jk in ALADIN-HR4

- Include large scale information from global model; Guidard and Fischer (2008)
- V matrix calculated from 16 ECMWF ensemble members over period 10.08. - 08.09.2019.
- Further steps:
  - Calculate ALADIN-HR4 B matrix from same sample using local DA ensemble (ensemble of perturbed analysis)
  - Test influence of Jk on analysis and verification scores over some period; look into case studies

Plans for 2020

- Move DA to cy43
- New HPC?
- Continue Jk tests
- Start with radar data assimilation tests on cy43