DATA SET DESCRIPTION

Content of data set: forecasts for different meteorological variables based on AROME numerical weather prediction model

Name of data set files:

For 2-dimensional fields:
AROME-<variable>-<YYYYMMDD>_<HHmm>+<TTTtt>.nc.zip, where
 <variable>: meteorological variable,
 <YYYYMMDD>: date of the forecast run,
 <HHmm>: initial time of the forecast in UTC,
 <TTTtt>: forecast lead time in hour (TTT) and minute (tt)

For 3-dimensional fields on pressure levels:
AROME-<variable>**_p<pressure_level>**-<YYYYMMDD>_<HHmm>+<TTTtt>.nc.zip, where
 <variable>: meteorological variable,
 <pressure_level>: pressure level in hPa,
 <YYYYMMDD>: date of the forecast run,
 <HHmm>: initial time of the forecast in UTC,
 <TTTtt>: forecast lead time in hour (TTT) and minutes (tt)

For 3-dimensional fields on height levels:
AROME-< variable >**_h<height_level>**-<YYYYMMDD>_<HHmm>+<TTTtt>.nc.zip, where
 <variable>: meteorological variable,
 <height>: altitude over the surface in meter,
 <YYYYMMDD>: date of the forecast run,
 <HHmm>: initial time of the forecast in UTC,
 <TTTtt>: forecast lead time in hour (TTT) and minutes (tt)

DATA SET CHARACTERISTICS
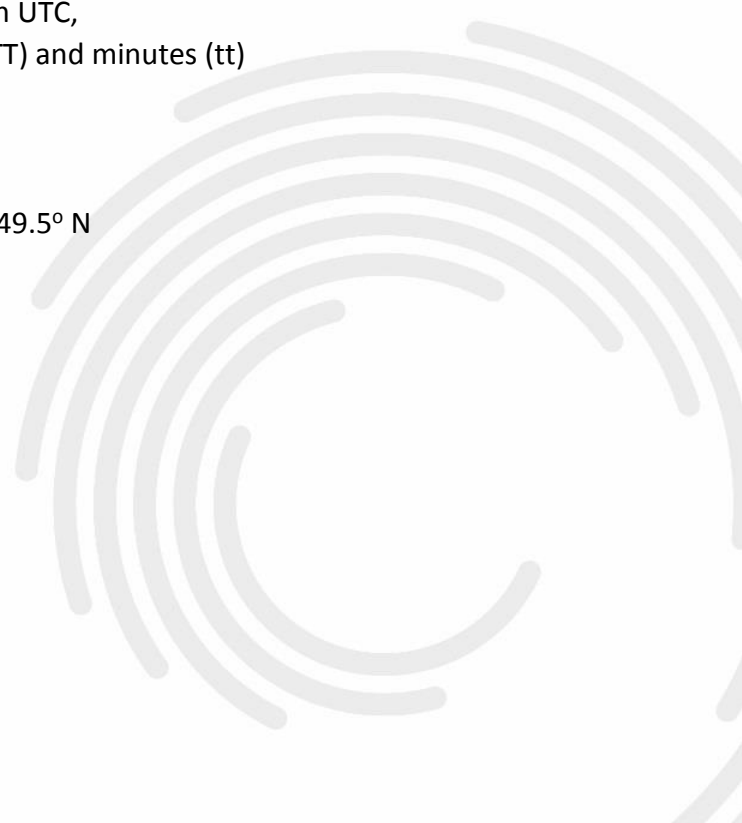
Spatial coverage: 14.3º E – 24.3º E; 44.9º N – 49.5º N
Temporal coverage: 0 – 48 hours
Spatial resolution: 0,025º x 0,025º
Temporal resolution: 1 hour
Projection: latlon
Format(s): netcdf compressed into zip file

Parameter(s):

Parameter	Description	Unit
2-dimensional fields		
Tsurf	surface temperature	K
SnowM	snow mass	kg·m^{-2}
CloudTot	total cloud cover	-
PSurf	surface pressure	Pa
Snowd	snow depth	mm
SWRadSurf	accumulated short wave radiation on the surface	J
InstPrec	total instantaneous precipitation	mm·h^{-1}
PrecTot	total accumulated precipitation	mm
SnowTot	total snow and graupel	mm
SurfRain	total rainfall	mm
U10	U-component of wind at 10 meters	m·s^{-1}
V10	V-component of wind at 10 meters	m·s^{-1}
T2	temperature at 2 meters	K
RelHum2	relative humidity at 2 meters	-
Tmin2	minimum temperature at 2 meters	K
Tmax2	maximum temperature at 2 meters	K
Wgust	wind gust at 10 meters	m·s^{-1}
pblh	height of the planetary boundary layer	m
DT	dewpoint at 2 meters	K
mslpres	mean sea level pressure	Pa
CAPE	convective available potential energy	J·kg^{-1}
CCL	convective condensation level	m
surfgeo	surface geopotential (only in the first step)	m^2·s^{-2}
lsmask	land sea mask (only in the first step)	-
3-dimensional fields on pressure levels		
levels: 1000 hPa, 850 hPa, 700 hPa, 500 hPa		
u	eastward wind on pressure levels	m·s^{-1}
v	northward wind on pressure levels	m·s^{-1}
T	temperature on pressure levels	K
Geopot	geopotential on pressure levels	m^2·s^{-2}
RelHum	relative humidity on pressure levels	-
3-dimensional fields on height levels		
levels: 100 m		
u_pbl	eastward wind in the planetary boundary layer	m·s^{-1}
v_pbl	northward wind in the planetary boundary layer	m·s^{-1}
T_pbl	temperature in the planetary boundary layer	K
RelHum_pbl	relative humidity in the planetary boundary layer	-

Uncertainties: Accuracy of forecast initial condition depends on reliability of the involved information (i.e. observations, background forecasts) and the applied assimilation method. Numerical weather prediction models solve the governing equations in approximate way (e.g. in grid points, using parameterizations). For regional forecasts, information is needed about large-scale processes. Lateral boundary conditions are provided mostly by global model outputs having similar uncertainties as limited area forecasts.

DATA ORIGIN, METHODOLOGY

The AROME project was initiated at the Météo-France in 2000 to develop a high-resolution limited area model. AROME is a non-hydrostatic meso-scale numerical weather prediction model with advanced physical parametrizations. It is operated on the supercomputer of the Hungarian Meteorological Service 8 times per a day for short-range forecast and nowcasting purposes. The AROME forecasts have 59 vertical levels between the surface and 2.7 hPa level, its horizontal resolution is 2.5 km.

Szintai, B., Szűcs, M., Randriamampianina, R., Kullmann, L., 2015: Application of the AROME non-hydrostatic model at the Hungarian Meteorological Service: physical parametrizations and ensemble forecasting. [PDF]

VALIDATION AND UNCERTAINTY ESTIMATE

Monthly, seasonal and annual verification is made regularly. For more information please contact us.

CONSIDERATIONS/SUGGESTIONS FOR APPLICATIONS

Weather forecast

ADDITIONAL INFORMATION

https://www.met.hu/en/idojaras/elorejelzes/modellek/AROME/

REVISION HISTORY

2019: AROME cy40t1 model version

2021: AROME cy43t3 model version

CONTACT POINT

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