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THE NUMERICAL MODELING AT THE WMO REGIONAL CENTER MOSCOW
FOR OPERATIONAL WEATHER FORECASTING FROM LOCAL
TO PLANETARY SCALES
(BASED ON THE COSMO/ICON-RU SYSTEM)

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The numerical atmosphere modeling is the basis of all weather previsions from hours until seasons, as well of the climate changes. For every-day operational weather forecasting the special technological systems of high-resolution modeling and data proceeding were developed in different countries with using of huge supercomputer powers. Following the World Meteorological organization (WMO) destinations, the world (WMC) and regional specialized meteorological centers (RSMC) provide the numerical forecasts. The Moscow Center (as Hydrometeorological Center of Russia) has the both destinations – as the world and the regional center. In the competence of the RSMC, the multy-scale forecasting system COSMO-Ru has been developed at the RSMC Moscow for almost 20 years. A series of forecasts are issued 4 times a day for waste domain, including whole Russia and neighboring regions (since 2025 for all non-tropical area of Northern Hemisphere – after implementation into COSMO-Ru system of the configuration of model ICON) with grid-space 6.6 km until 120 h and for area of European part of Russia and neighboring regions on the grid 2.2 km until 48 h. The presentation provides a short description of the current state and development trends of numerical atmospheric modeling in the leading WMO centers for numerical weather forecasting. The COSMO/ICON-Ru high resolution forecasting system, developed at the Hydrometeorological Center of Russia based on the ICON and COSMO models, as well it development for a some computational domains, including the region of the Republic of Armenia, are considered. The importance of using non-hydrostatic approximation and convective-resolving grids in regional configurations is emphasized, as well as the specifics of interpreting of high-resolved modeling products.

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Keywords: numerical weather prediction, atmospheric model, weather phenomena, forecasting system, ICON model, COSMO-Ru system.

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