Optimal conditions for obtaining high-quality lead-free coatings with high solderability were developed. The best PPR mode was selected: $i^k_{cp} = 1{,}0$ A/dm^2, $\tau_{forw} : \tau_{rev} = 4{:}1$, $f = 0{,}1..1$ Hz.

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MODERN TECHNOLOGIES IN TASKS OF WEATHER FORECASTING

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This article deals with modern technologies of processing of weather information. The model WRF (Weather Research and Forecasting) of weather forecasting is described in it.

In the atmosphere there are the diverse physical processes which are continuously changing its state. The physical condition of the atmosphere near the earth's surface and in the lower 30 – 40 km is called weather. Data for a weather forecast are gathered from various sources: meteorological stations, meteorological balloons, space satellites, etc. World centers of a weather forecast receive information from all over the world and compose global weather forecasts (fig. 1).
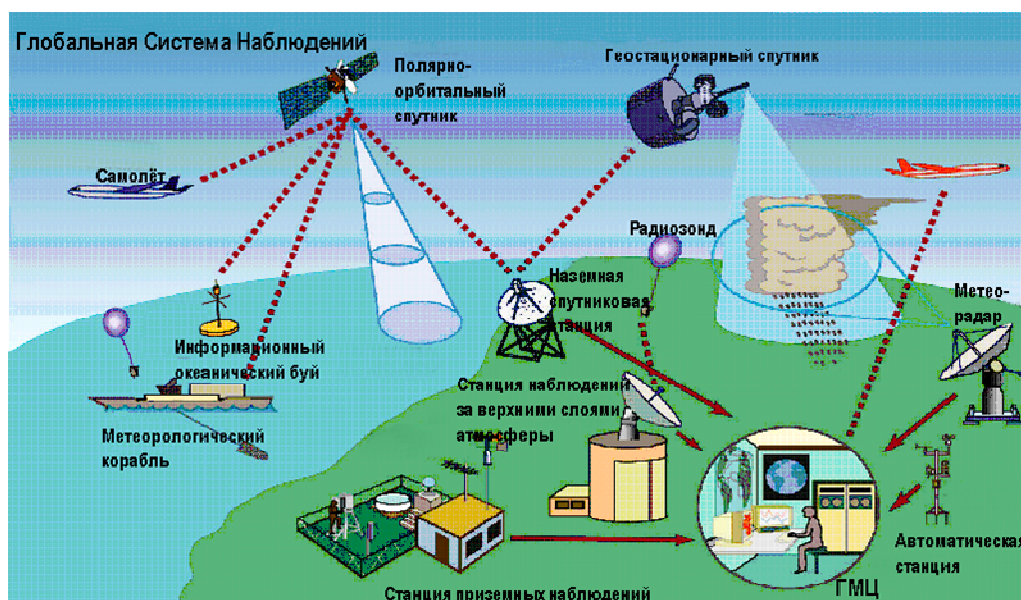

Fig. 1. Composition of global weather forecast

Weather forecasting are used synoptic, statistical and numerical methods. Synoptic method of forecasting is based on the analysis of weather charts. Statistical forecasting methods allow the past and present state of the atmosphere to predict the future state of the weather, i.e. predict changes in various meteorological parameters in the future. Numerical weather prediction (NWP) became a significant source for weather forecasts. NWP model is a modern set of computer programs that contains mathematical and physical equations / algorithms to describe

the atmosphere and its changes over time to create weather forecasts. On scale reproducible processes are global, regional and mesoscale [1].

Nowadays global models of the atmosphere don't consider all local features of territories for which the forecast is formed. Application in daily practice of the mesoscale WRF model (Weather Reseach and Forecasting) allows to reproduce more precisely processes in small scales that is necessary for forecasting of the weather phenomena. Weather Research and Forecasting (WRF) – one of the most modern and developing systems of numerical weather prediction and atmospheric modeling [2].

The main WRF components include dynamic core, program modules of presentation of physical processes (Physics Packages) and the interface of their interaction with dynamic core (Physics Interface), the module of variation assimilation of these meteorological observations (WRF–Var) and model of a chemical composition of the atmosphere (WRF–Chem). The external WRF components are the system of preparation of entrance data of WRF Preprocessing System (WPS), system of the objective analysis of these standard meteorological observations of OBSGRID, various software of visualization and the subsequent processing of the output data of WRF (fig. 2) [3].
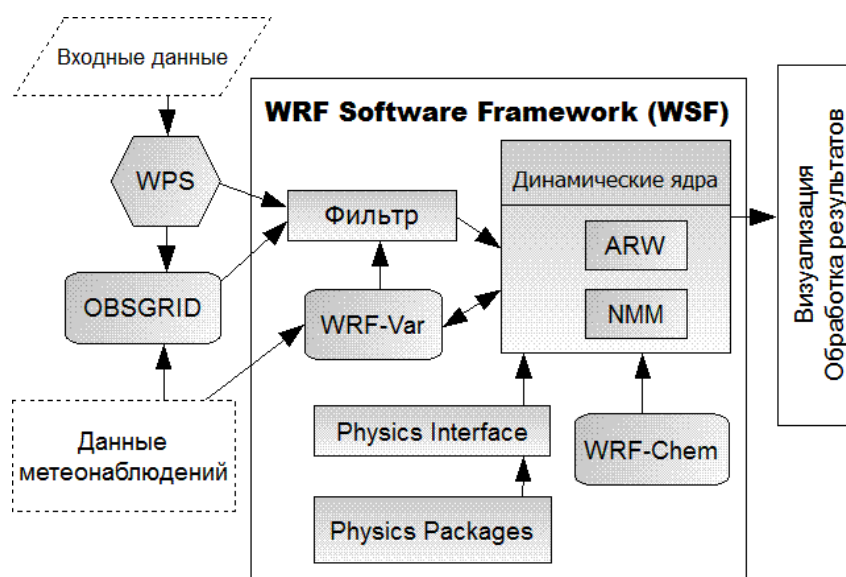

Fig. 2. Components of model WRF

How the model actually works? Downloaded set of input data (the current state of the atmosphere) is the result of another atmospheric model calculations. Then the preprocessing module starts, which consists of three programs: geogrid.exe – process static data (topography, soil types, hydrography); ungrib.exe – unpacks the initial data; metgrid.exe – interpolates the above data in a grid of model. Then the core of the model starts, which with the help of numerical methods solves the nonlinear system of differential equations. It consists of two programs: real.exe – performs vertical interpolation of input data; wrf.exe – solving core (fig. 3) [3].
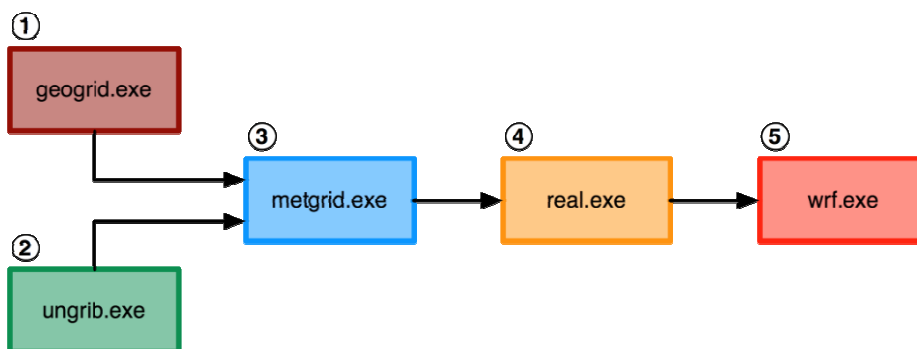

Fig. 3. Programs of the preprocessing module

Modifying different parameters, you can choose different color drawing data, labels etc. For each parameter (temperature, pressure, wind and precipitations) creates a separate file (fig. 4).
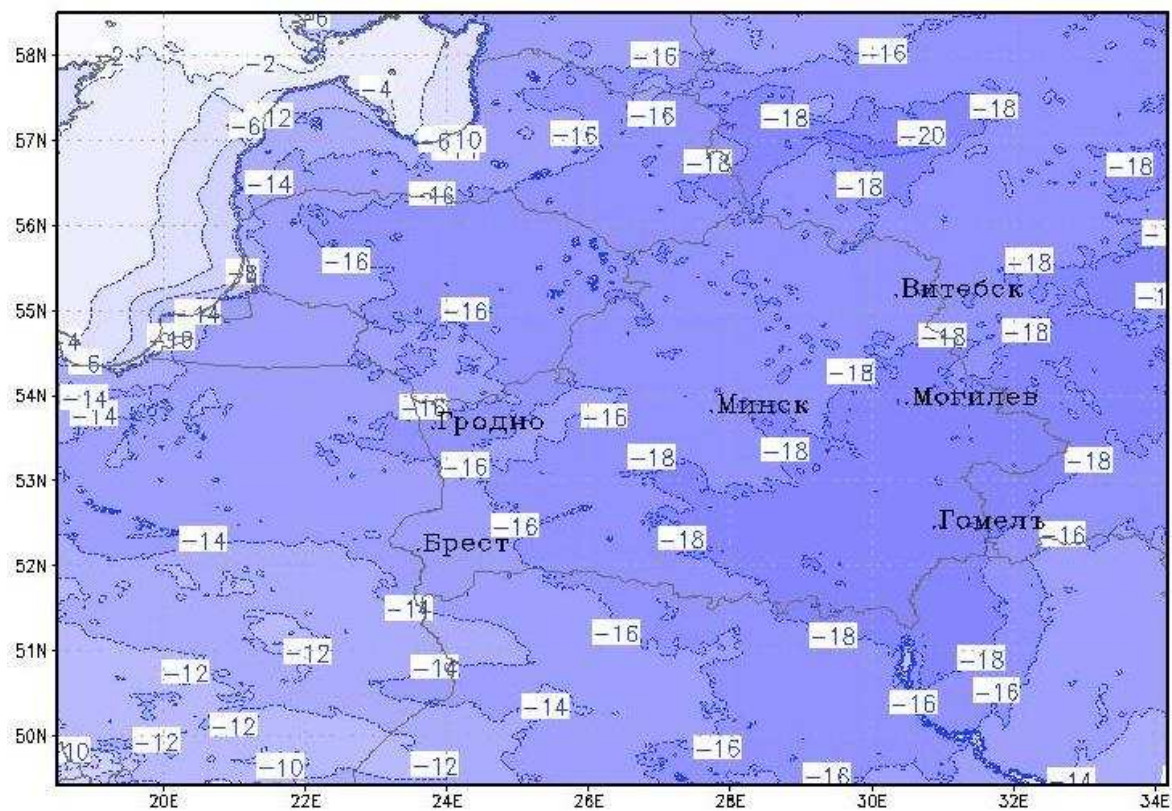

Fig. 4. The result of the work model WRF

The WRF model allows to automate the process of modeling of weather and obtain the necessary information for weather prediction. Being free software, WRF used in scientific and practical purposes in different countries of the world and is continuously developed.

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ELECTRIC DRIVE FED FROM BATTERIES. ANALYSIS AND MODELING OF PROCESSES

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The paper reviews the work of induction motor with three-phase inverter feeds by batteries, which can be used in electric vehicles. Simulation model and transients are presented.

Many manufacturers around the world are investing heavily in the development of electric vehicles, fueled by a steady rise in prices of petroleum products, the need to reduce emissions from the car and the development of energy storage devices, power consumption technologies. The term "electric vehicle", or "electromobile" refers to a vehicle that is driven by one or more electric motors.

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