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Numerical Weather Prediction Models on Linux Boxes as tools in meteorological education in Hungary

A.Z. Gyongyosi (1), K. Andre (1), P. Salavec (1), A. Horanyi (2), G. Szepszo (2), M. Mille (2), P. Tasnadi (1), and T. Weidiger (1)

(1) Department of Meteorology, Eotvos Lorand University, Pazmany P. st. 1/A, 1117 Budapest ,Hungary, (2) Hungarian Meteorological Service, Kitaibel P. st. 1., Budapest, Hungary

Education of Meteorologist in Hungary – according to the Bologna Process – has three stages: BSc, MSc and PhD, and students graduating at each stage get the respective degree (BSc, MSc and PhD). The three year long base BSc course in Meteorology can be chosen by undergraduate students in the fields of Geosciences, Environmental Sciences and Physics. BasicsFundamentals in Mathematics (Calculus), Physics (General and Theoretical) Physics and Informatics are emphasized during their elementary education. The two year long MSc course – in which about 15 to 25 students are admitted each year – can be studied only at our the Eötvös Loránd uUniversity in the our country. Our aim is to give a basic education in all fields of Meteorology. Main topics are: Climatology, Atmospheric Physics, Atmospheric Chemistry, Dynamic and Synoptic Meteorology, Numerical Weather Prediction, modeling Modeling of surfaceSurface-atmosphere Iinteractions and Cclimate change. Education is performed in two branches: Climate Researcher and Forecaster. Education of Meteorologist in Hungary – according to the Bologna Process – has three stages: BSc, MSc and PhD, and students graduating at each stage get the respective degree. The three year long BSc course in Meteorology can be chosen by undergraduate students in the fields of Geosciences, Environmental Sciences and Physics. Fundamentals in Mathematics (Calculus), (General and Theoretical) Physics and Informatics are emphasized during their elementary education. The two year long MSc course – in which about 15 to 25 students are admitted each year – can be studied only at the Eötvös Loránd University in our country. Our aim is to give a basic education in all fields of Meteorology: Climatology, Atmospheric Physics, Atmospheric Chemistry, Dynamic and Synoptic Meteorology, Numerical Weather Prediction, Modeling of Surface-atmosphere Interactions and Climate change. Education is performed in two branches: Climate Researcher and Forecaster. Numerical modeling became a common tool in the daily practice of weather experts forecasters due to the i) increasing user demands for weather data by the costumers, ii) the growth in computer resources, iii) numerical weather prediction systems available for integration on affordable, off the shelf computers and iv) available input data (from ECMWF or NCEP) for model integrations. Beside learning the theoretical basis, since the last year. Students in their MSc or BSc Thesis Research or in Student's Research ProjectsStudent's Research Projects h have the opportunity to run numerical models and to analyze the outputs for different purposes including wind energy estimation, simulation of the dynamics of a polar low, and subtropical cyclones, analysis of the isentropic potential vorticity field, examination of coupled atmospheric dispersion models, etc. A special course in the application of numerical modeling has been held (is being announced for the upcoming semester) (is being announced for the upcoming semester) for our students in order to improve their skills on this field.
Several numerical model (NRIPR ETA and WRF) systems have been adapted in the University and integrated WRF have been tested and used for the geographical region of the Carpathian Basin (NRIPR, ETA and WRF). Recently ALADIN/CHAPEAU the academic version of the ARPEGE ALADIN cy33t1 meso-scale numerical weather prediction model system (which is the operational forecasting tool of our National Weather Service) has been installed at our Institute. ALADIN is the operational forecasting model of the Hungarian Meteorological Service and developed in the framework of the international ALADIN co-operation. Our main objectives are i) the analysis of different typical weather situations, ii) fine tuning of parameterization schemes and the iii) comparison of the ALADIN/CHAPEAU and WRF model outputs based on case studies. The necessary hardware and software innovations has have been done.
In the presentation the computer resources needed for the integration of both WRF and ALADIN/CHAPEAU models will be briefly described. The software developments performed for the evaluation and comparison of the different modeling systems will be demonstrated. The main objectives of the education program on the practical numerical weather modeling will be introduced, as well as its detailed thematics and the structure of the labs.