"ALADIN" WEATHER MODEL LOCAL REVISIONS USING THE DIFFERENTIAL POLYNOMIAL NEURAL NETWORK

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Abstract: The 48-hour "Aladin" forecast model can predict significant meteorological quantities in a middle scale area. Neural networks could try to replace some statistical techniques designed to adapt a global meteorological numerical forecast model for local conditions, described with real data surface observations. They succeed commonly a cut above problem solutions with a predefined testing data set, which provides bearing inputs for a trained model. Time-series predictions of the very complex and dynamic weather system are sophisticated and not any time faithful using simple neural network models entered only some few variables of their own next-time step estimations. Predicted values of a global meteorological forecast might instead enter a neural network locally trained model, for refine it. Differential polynomial neural network is a new neural network type developed by the author; it constructs and substitutes for an unknown general sum partial differential equation of a system description, with a total sum of fractional polynomial derivative terms. This type of non-linear regression is based on trained generalized data relations, decomposed into many partial derivative specifications. The characteristics of composite differential equation solutions of this indirect type of a function description can facilitate a much greater variety of model forms than is allowed using standard soft-computing methods. This adjective derivative model type is supposed to be able to solve much more complex problems than is usual using standard neural network techniques.

Key words: *Polynomial neural network, differential equation composition, sum relative derivative term, multi-parametric function approximation*

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1. Introduction

The short-term numerical "Aladin" forecast model is a limited area version of a global French model ARPEGE and it needs to be forced by a global model which has to provide lateral boundary conditions. It refines the ARPEGE model on a

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