The neural networks application for estimation of wheels braking actual parameters for an airplane on the runway covered with precipitations

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The experience of neural network application for determination of airplane's wheels drag actual coefficient on the runway covered with precipitations is introduced. DCSL (Dynamic Cell Structure) neural network from “Adaptive Neural Network Library” was selected as a tool of identification. The task is solved in Matlab Simulink environment. The program includes math model of aircraft motion along runway. Available aerodynamic and altitude-airspeed performances of engines are used. Runway surface gradients (slopes), which correspond to the experimental data, are taken into account. The data from airplane runs during flight tests in actual conditions are used to create a samples for neural networks training. The obtained by identification wheels drag parameters (braking, rolling resistance and contamination drag) and the convergence between the results received in test modeling and the experimental data are shown.

Keywords: Adaptive Neural Network, Math model of aircraft motion along runway, Identification, Runway surface gradients, Flight tests, Braking resistance, Rolling resistance.