The way of program optimization for the subsonic passenger aircraft flight at cruising segment

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Flight simulation described here is based on traditional approaches used for subsonic passenger aircrafts. Optimization of the cruising segment has been performed taking into account operating limitations of civil aviation. For simulating flight conditions the embedded model of bypass turbojet engine has been used. It makes possible to calculate power plant parameters under any flight conditions. The traditional approaches for simulating subsonic aircraft flying in a vertical plane have also been used. Algorithm of calculation reflects the characteristics of individual sections of the flight: take-off, initial climb, the main climb and so on. For each section the system of differential equations of motion specific for a given aircraft flight condition has been made up. Systems of differential equations have been solved numerically by predictor-corrector method. A program simulating the flight of a passenger plane has been developed. The optimal flight program for the long-haul aircraft with high aerodynamic efficiency has been obtained. The required en-route fuel reserve at different flight ranges has been analyzed.

Keywords: *flight simulation, modeling GTE, program optimization for the passenger aircraft flight.*

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