Influence of atmospheric variables on passenger aircraft control optimization at descent segment

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The article considers the influence of climatic conditions on subsonic long-haul passenger aircraft optimal flight program at descent segment. Flight program optimization at this segment takes into account civil aviation operational constraints, namely the vertical velocity component limitation at descending. The flight segment descending-braking optimization is performed while minimizing the fuel consumption at this flight segment. In the flight simulation an integrated model of turbojet engine is used, which allows us to calculate the power plant characteristics at each step of integration of differential equations. Flight simulation and power plant characteristics are based on modern traditional approaches. The study considers the climatic conditions influence on the aircraft descending optimal program, carries out calculations for 6 standards of air temperature changes in height (depending on climate zone). The article examines the atmospheric conditions influence on the flight program optimization results at the descending segment.

Keywords: *passenger aircraft control, aircraft control optimization, optimal flight program, flight simulation, long-haul passenger aircraft, atmospheric parameters influence, vertical velocity components, operating limitations.*

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