

DESIGN OF AIRCRAFT SPACE INDEXED GUIDANCE ALONG AN AIRSTREAM

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Abstract

In this study it is considered that in regions presenting high air traffic density, traffic can be organized along main airstreams using common spatial reference tracks. The adoption of such spatial references should ease the traffic separation task. The concept of airstream is introduced as well as the basis for a spatial indexed guidance law allowing accurate lateral trajectory tracking of a 3D spatial reference while spatial and time separations between successive aircraft (relative time RT constraints) present in the same air stream are insured. Here transportation aircraft guidance dynamics are expressed in a local space indexed cylindrical frame and a nonlinear control structure is proposed to achieve the guidance objective.

Then standard trajectories within an airstream are characterized and parametrized. Finally the management on a spatial basis of traffic inside the airstream, where feasible and conflict free candidate trajectories are identified, is analyzed and on-line heuristic procedures are proposed.