Traffic Management along Air Streams through Space Metering

Via the current performances of aeronautical communication, navigation and surveillance systems, free flight and traffic management through trajectory negotiation have become a reality. However, the adoption of free flight in congested airspace leads to an increase of the number of potential traffic conflicts which are solved by diverting aircraft from their original flight plan, limiting the benefits of free flight. For high density traffic, air corridor concept and time-based flow management have recently been proposed. In the present paper, it is proposed to organize main traffic flows in congested airspace along air streams which are characterized by a three-dimensional (3D) common reference track and lateral lanes with a dynamic slot structure. There aircraft position is processed in a local space indexed axial coordinates system which should ease the management of traffic separation and surveillance. This change results in the need to develop new 3D space indexed guidance modes to perform position tracking, as well as to design and assign standard trajectories to enter into, evolve inside and exit from the air stream while insuring time and space separation between aircraft.