

[EN-A-35] Macroscopic Analysis to Identify Stage Boundaries in Multi-Stage Arrival Management

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⁺E. Itoh*, Y. Miyazawa*, M. Finke**, J. Rataj**

*ATM Department

Electronic Navigation Research Institute (ENRI),
National Institute of Maritime, Port and Aviation Technology (MPAT)
Tokyo, Japan
[eri |miyazawa_y]@mpat.go.jp

**Institute of Flight Guidance

Department of Controller Assistance
German Aerospace Center (DLR)
Braunschweig, Germany
[michael.finke |juergen.rataj]@dlr.de

Abstract: Accommodating the air traffic growth, reducing arrival delay is one of the most important functions of designing the ATM system. One of the newest concepts to further optimize arrival flows is multi-stage arrival management, proposed by DLR, in which different guidance principles to manage the arriving traffic are implemented in different stages. These stages are optimized to the core management task to be done in a certain area of the arrival stream and the conditions of the surrounding environment. This paper discusses this concept through a macroscopic analysis on the overall arrival traffic flows. Further, this paper analyzes parts of the multi-stage arrival management concept applied to Tokyo International Airport as a case study. A stochastic characteristic of arrival trajectories will be discussed as a counterpart of conventional deterministic trajectory-based operation based on data-driven analysis and arrival procedures at the airport. The best strategies of shifting arrival flow control to time-based management is analyzed based on the stochastic data analysis. Impacts of pop-up aircraft are discussed as one of the causes to increase uncertainties in aircraft trajectory management.

Keywords: Arrival Management, Multi-Stage, Arrival Delay, Air Traffic Management