

Thema: An Approach for Air Traffic Synchronisation in the Central European Upper Airspace

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Kurzinhalt:

The synchronisation model is designed for a high traffic load forecasted for the CEATS airspace in the year 2020. Since more than 50% of the traffic in a route is flying on two flight levels only, and is represented by mainly two speeds, an algorithm is developed to reorganise this traffic. A synchronised traffic flow is defined by aircraft flying the same speed and thus obtaining constant distance separation.

Several scenarios employing different values of the speed parameter for two specific routes are computed into the synchronisation algorithm. The calculations have shown that the degree of synchronisation can be increased by approximately 20 % in each scenario except in the second scenario for the route TONDO – PASAU. There, with a speed adjustment allowed of +/- 0.01 Mach, many aircraft are shifted into the adjacent flight level. This strongly increases a small group of aircraft flying at this speed. Additional shifts of aircraft from neighbouring flight level into the synchronisation flight level are increasing the degree of synchronisation. However, this creates a stronger irregularity of traffic load and a higher conflict potential might arise. It was found that with a preference to as few as possible modifications in altitude, and an improvement in the regularity of the traffic load between the flight levels, scenarios with a speed adjustment over +/- 0.02 Mach achieve better results (scenarios 1). The costs described by the distance related fuel consumption can decrease. This happens in scenario 1 of the route CHIEM – JULIE, because many aircraft accelerate in order to achieve the synchronisation speed. Therefore, the comparison of the predefined indicators and the costs suggests selecting scenario 1 for both routes.

With these scenario computations, it is shown that synchronisation is a useful approach to reorganise the traffic in order to cope with future demands.

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