Optimal Schedule Adjustment for Expected Aircraft Shortage in Multi-Fleet Operations

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Abstract──This research develops several network models for carriers that both efficiently and effectively adjust schedule resulting from the expected aircraft shortage for the operation of multiple fleets as well as non-stop and one-stop flights. These models are formulated as pure network flow problems or multi-commodity network flow problems. The former are solved using the network simplex method while the latter are solved using a Lagrangian relaxation-based algorithm. A case study regarding the international operations of a major Taiwan airline is presented.

Keywords──Expected aircraft shortage, Schedule adjustment, Time-space network, Multi-commodity network flow problem, Lagrangian relaxation

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