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Possibilities and Limitations Using Flightradar24, ADS-B and Mode S Data for Aircraft Performance Analysis – an Overview

Automatic dependent surveillance-broadcast, short ADS-B, is used for surveillance purposes by air traffic control. Besides that, it is used by flight tracking services and also gains popularity among private users. In this project, different sources of aircraft and flight data are discussed. On the one hand, the data provided by the flight tracking service Flightradar24. Different cases, each representing another possible aircraft performance or flight analysis, are presented and it is evaluated whether Flightradar24 data is suitable for this analysis. To demonstrate the value of Flightradar24 data, a study of initial cruise altitude and step climbs with 440 data sets of different aircraft types is conducted and the first findings are derived. (Step climbs shown in Figure 1). On the other hand, a homebuilt receiver for ADS-B and other Mode S data is used. The technology behind ADS-B is presented and a decoding script for ADS-B and Comm-B messages, based on the open-source python library pyModeS, is developed. The potential of this data source is shown by analyzing flight data from an aircraft using the homebuilt set-up. The different sources are compared, and the results show that the data sources differ significantly in terms of the number of parameters, data rate, and coverage. Finally, a recommendation of data sources for different fields of application is proposed.

This informative poster is based on a student project with the same title. Details here:

<https://nbn-resolving.org/urn:nbn:de:gbv:18302-aero-2020-03-25.017>

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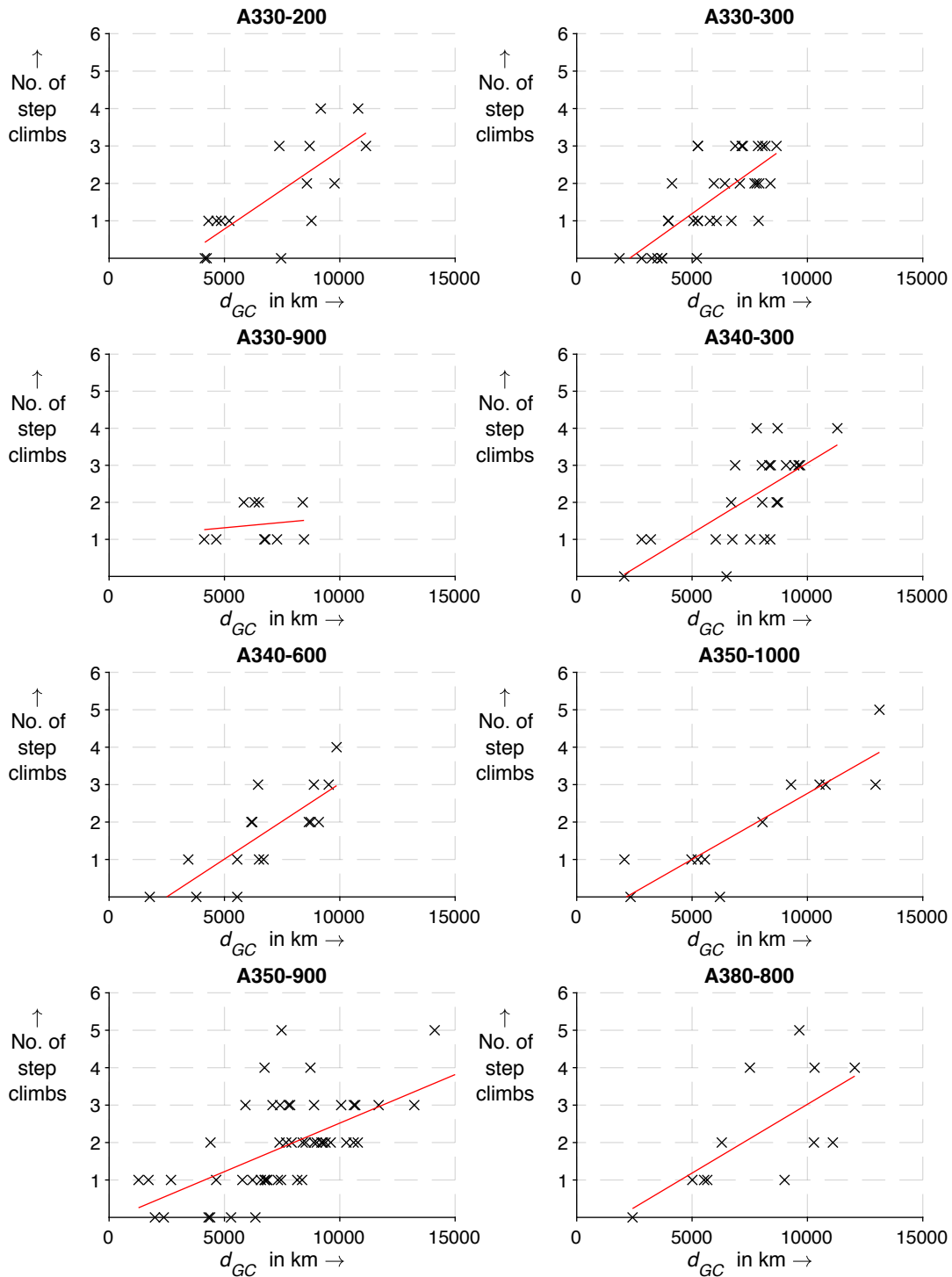


Figure 1: Number of step climbs relative to great circle distance of selected Airbus wide-body aircraft types

d_{GC} Great circle distance between origin and destination airport
 — Linear regression