Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

A High-resolution Rapidly-updated Meteorological Data Analysis System for Aviation Applications CHI SHING LAU, MING CHUNG CHU, JONES TSZ-KAI WAN, The Chinese University of Hong Kong, PING WAH LI, Hong Kong Observatory — We present our work on the recent development of a high spatial- and temporal-resolution meteorological data analysis system for the identification and monitoring of mesoscale to microscale weather phenomena over the Hong Kong International Airport (HKIA) and its vicinity. The system can be updated minutely with a horizontal resolution of 150 m. The system is adapted from the Local Analysis and Prediction System (LAPS) from NOAA. Apart from conventional data such as automatic weather stations, wind profilers and satellite observations, automatic aircraft reports (AMDAR), LIDARs and Terminal Doppler Weather Radar (TDWR) data are ingested into the system. The LIDAR and TDWR data are complimentary to each other so that wind field can be identified in both clear and convective weather. Ingesting the above data into the system helps generate a comprehensive 3-dimensional structure of the atmosphere over the airport and nearby airspace. The analysis system would also be useful for nowcasting aviation-related weather after integrating with numerical weather prediction models. Several cases such as land-sea breeze, gust front and tropical cyclone are discussed. Our results could bring significant insights into aircraft safety and air traffic efficiency to the flights operating at other airports over the world.

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Date submitted: 27 Nov 2007 Electronic form version 1.4