General Aviation Flight Operations Quality Assurance Through the use of ADS-B: Most general aviation (GA) aircraft incidents occur during the landing and takeoff phases of flight (National Transportation Safety Board, 2014). Although this is a key phase of flight requiring effective energy management of the aircraft by the pilot, no current process exists to monitor pilot performance in GA.

In the world of commercial air travel, many operators of jet aircraft record and monitor aircraft state data throughout a flight, in a system known as flight operations quality assurance (FOQA). This data is used by the operator to reduce safety risks and regulatory deviations. In a statement regarding the use of FOQA data in aviation safety programs the Federal Aviation Administration (FAA) said “wide implementation of FOQA programs could have significant potential to reduce air carrier accident rates below current levels.” Currently, this kind of data is not available for capture on GA aircraft due to the lack of monitoring systems that are ubiquitous on transport aircraft. However, a new technology standard is being implemented which will provide many of the key data points required to implement FOQA in GA.

Automatic dependent surveillance-broadcast (ADS-B) will be mandatory for GA aircraft in the U.S.A. by 2020. ADS-B provides GPS position, velocity, type, ID, etc in one second increments and is broadcast in a plain format over the air. Through use of a software radio, data broadcast by aircraft within line-of-sight of the antenna may be captured. Currently, this is done commercially by www.flightradar24.com at sites across the world.

Proposed is the analysis of the data broadcast by ADS-B, historically and in real time at an airport serving GA operations. Combining aircraft type with position state data may be used to construct statistical models for the aircraft energy state during landing and takeoff phases of flight. Following a period of heuristic analysis, metrics for real-time alerts for aircraft deviations could be developed and provided to GA training programs. Thus providing a comparable alternative to FOQA for GA operations.