These are the columns (features) definitions.

time (I already converted this to more readable timestamps for you)

This column contains the unix (aka POSIX or epoch) timestamp for which the state vector was valid. You'll find one state vector per second for each aircraft which was active within the coverage of OpenSky at that particular second. For more information on how these state vectors are generated, please refer to the API documentation. In the above example, the time is 1480760792 which means that we are looking at a state vector that was valid on Saturday, 03-Dec-16 10:26:32 UTC. Tip: There are online tools available for converting unix timestamps, just use Google.

icao24

This column contains the 24-bit ICAO transponder ID which can be used to track specific airframes over different flights. This ID should never change during a registration period of an airframe, which doesn't change very often. So if you are looking for a particular aircraft, try to find out its 24-bit transponder ID and filter by this column. In our data, it's represented as a 6 digit hexadecimal number (string). In our case, we are looking at the state of an aircraft using the transponder ID a0d724. If you look it up on our Aircraft Database, you'll find out that this transponder ID is used by an Airbus A306 owned by UPS. You will find this column in all tables.

lat/lon

These column contain the last known latitude and longitude of the aircraft. Coordinates are stored as decimal WGS84 coordinates. So here is what we know so far: On Saturday, 03-Dec-16 at 10:26:32 UTC, the UPS aircraft with transponder ID a0d724 was at position 37.89463883739407,-88.93331113068955. If you look it up on Google maps, it's somewhere in Illinois in the US.

velocity

This column contains the speed over ground of the aircraft in meters per second. In our example, the UPS aircraft flew over Illinois at a speed of 190.8504039695975 meters per second.

heading

This column represents the direction of movement (track angle) as the clockwise angle from the geographic north. Just a little side note for the aviation experts: you might want to complain that the term "heading" is not perfectly correct (if you are one of them you know what I mean) and something like "track" or "track angle" might be more correct. You are absolutely right and this might change in future releases, but for legacy reasons it's called "heading" for now. In our case, the aircraft flew into the direction 265.8263544365708° clockwise from geographic north, or in other words, to the west.

vertrate

This column contains the vertical speed of the aircraft in meters per second. A negative number indicates that the aircraft was descending, a positive number indicates a ascend respectively. In the above example, the UPS aircraft was neither ascending nor descending.

callsign

This column contains the callsign that was broadcast by the aircraft. Most airlines indicate the airline and the flight number in the callsign, but there is no unified system. In our example, the callsign indicates that this state vector belongs to UPS flight 858. By looking up the flightnumber on services like flightaware.com, you'll find out that this flight goes from Lousville to Phoenix every day.

onground

This flag indicates whether the aircraft is broadcasting surface positions (true) or airborne positions (false). Our UPS aircraft was airborne.

alert/spi

These two flags are special indicators used in ATC. If you need them, you'll know what they mean.

squawk

This 4-digit octal number is another transponder code which is used by ATC and pilots for identification purposes and indication of emergencies. Usually, ATC assigns squawks to aircraft when they enter their airspace via radio. In the above example, the UPS flight was assigned squawk "7775". See e.g. Wikipedia for a list of special purpose squawks.

baroaltitude/geoaltitude

These two columns indicate the aircraft's altitudel. As the names suggest, baroaltitude is the altitude measured by the barometer and depends on factors such as weather, whereas geoaltitude is determined using the GNSS (GPS) sensor. In our case, the aircraft was flying at a geometric altitude (or height) of 9342.12 meters and a barometric altitude of 9144 meters. That makes a difference of almost 200 meters. You are likely to observe similar differences for aircraft in spatial and temporal vicinity. Note that due to its importance in aviation, barometric altitude will almost always be present, while the geometric altitude depends on the equipage of the aircraft.

lastposupdate

This unix timestamp indicates the age of the position. The position of the state vector above was already 87.64 seconds old at the time when the state vector was created (time) and should not be used any longer.

lastcontact

This unix timestamp indicates the time at which OpenSky received the last signal of the aircraft. As long as the aircraft is flying in an airspace which is well-covered by OpenSky's receivers this timestamp should never be older than 1-2 seconds compared to the state vectors timestamp (time). Apparently, OpenSky's coverage in Illinois was not too good in December 2016 since the last contact indicates that the aircraft left the covered airspace already 82 seconds ago. OpenSky continues generating state vectors for 300 seconds after the last contact. Depending on your application, you can filter state vectors which are, e.g., older than 15 by adding a WHERE-clause to your query saying "WHERE time-lastcontact<=15". The relationship between the three timestamps explained so far is time > lastcontact >= lastposupdate.

- *Alex's note: These are SQL commands. Interpret them to python pandas filtering and use them if you think you need to.*

hour

Since batch layer version 4, the data is processed and partitioned in hourly batches. This timestamp marks the beginning of the hour to which the data belongs.