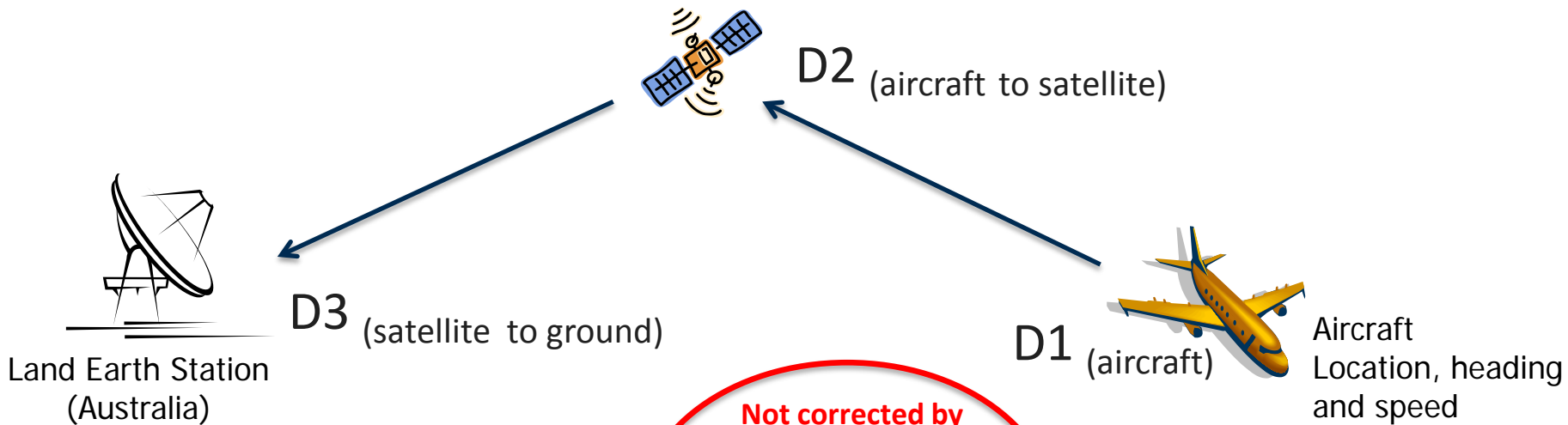


# **Differential Doppler study from Inmarsat concerning MH370, presented to the AAIB 23 March 2014**

# Doppler correction contributions

Satellite Location & Speed



D3 (satellite to ground)

D2 (aircraft to satellite)

D1 (aircraft) Aircraft Location, heading and speed

**Not corrected by system = measured frequency offset**

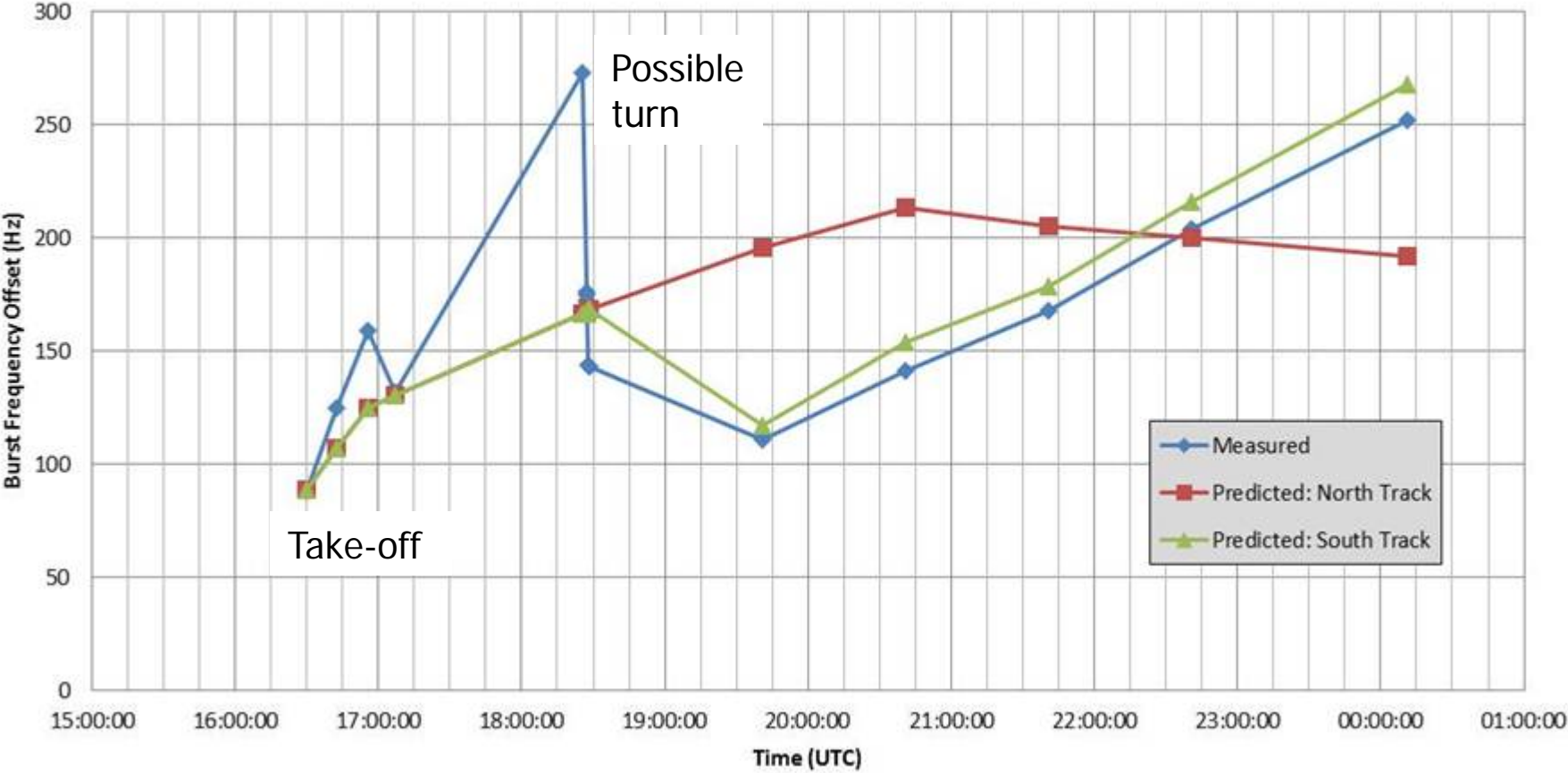
$$\text{Total Doppler} = D1_{\text{aircraft}} + D2_{\text{aircraft} \rightarrow \text{satellite}} + D3_{\text{satellite} \rightarrow \text{ground}}$$

The burst frequency offset is the difference (due to the Doppler contributions) between the expected received frequency and that actually measured.

D2 is a combination of the Doppler components due to the satellite motion, which is accurately known, and the aircraft heading and speed. Using the burst frequency offsets measured at the land earth station, it is possible to compare against the predictions for aircraft heading and speed.

# MH370 measured data against predicted tracks

MH370: Burst Frequency Offset Analysis (450 knots)



# Example Southern Tracks

(tracks ends at 00:11 UTC)

