

Microwave Temperature Profiler Data during HIPPO-1,2,3

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MTP Data Processing Overview

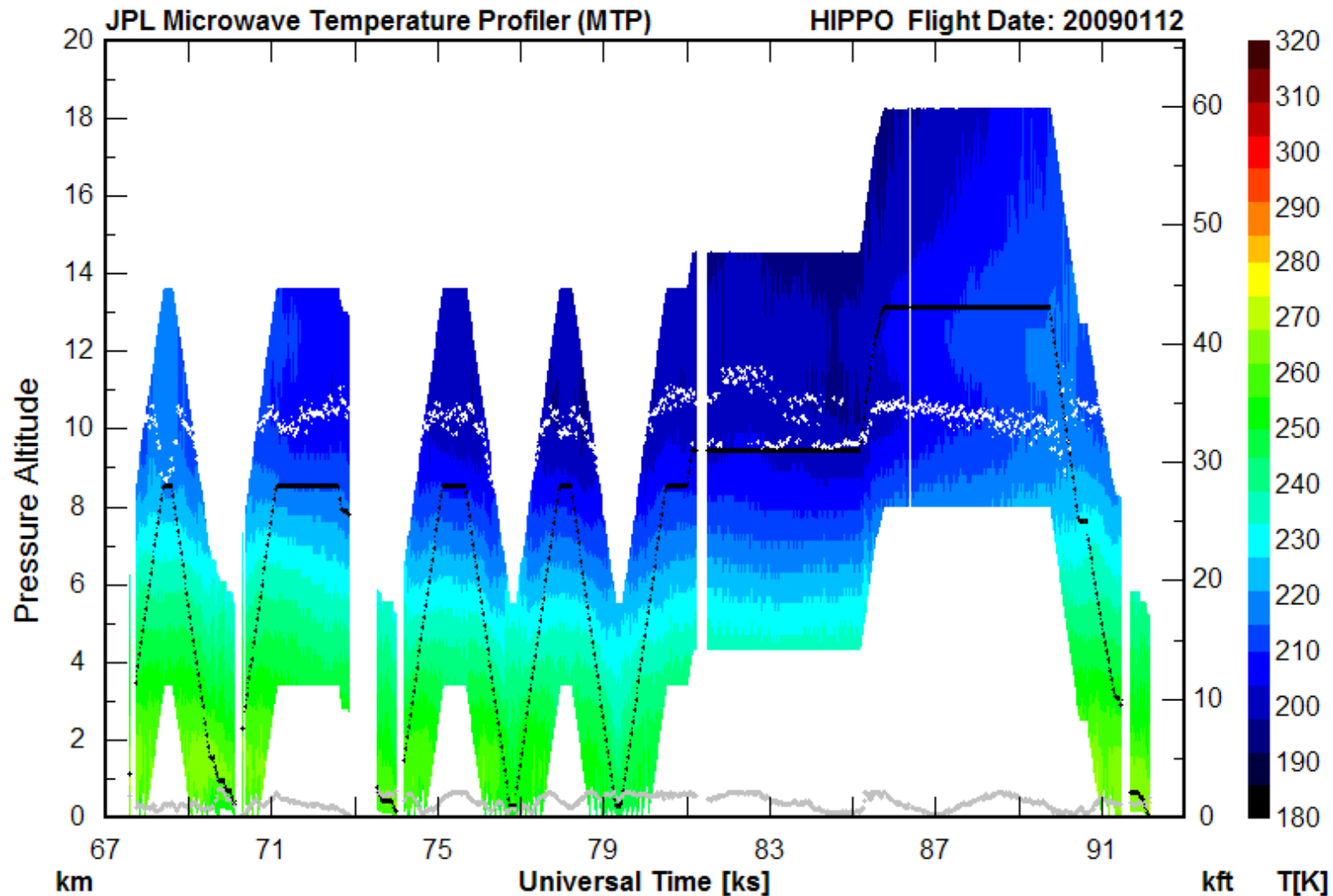
- Altitude changes have presented challenges; retrieval method assumes constant altitude for duration of scan (~18 seconds)
 - Addressed challenge by down-weighting data that is >~6 km from flight level
 - Limit vertical range of profiles in output files
- Occasional data gaps
 - RFI
 - problems with local oscillator component
 - steep ascent/descent rates; preserve as much data as possible

Data Status – HIPPO-1

- Submitted to archive
- NASA Ames format
- Header contains metadata and error estimates
- Data retrieved from all research flights with occasional gaps
- Quicklook images and data discussion at:
<http://mtp.jpl.nasa.gov/missions/hippo/hippo.html>

HIPPO-1

RF03: Polar flight (Anchorange)



Principal Investigator: MJ Mahoney (Michael.J.Mahoney@jpl.nasa.gov)

Flight: 2009 01 12 00:00:00 Retrieved: 2010 06 15 15:47:59 Edited: 2010 06 15 15:48:13 Plotted: 2010 06 15

Data Status – HIPPO-2

- Still processing data; nearing completion
- More noise than in HIPPO-3
- Working on refinements to individual cases
- Projected release in April-May

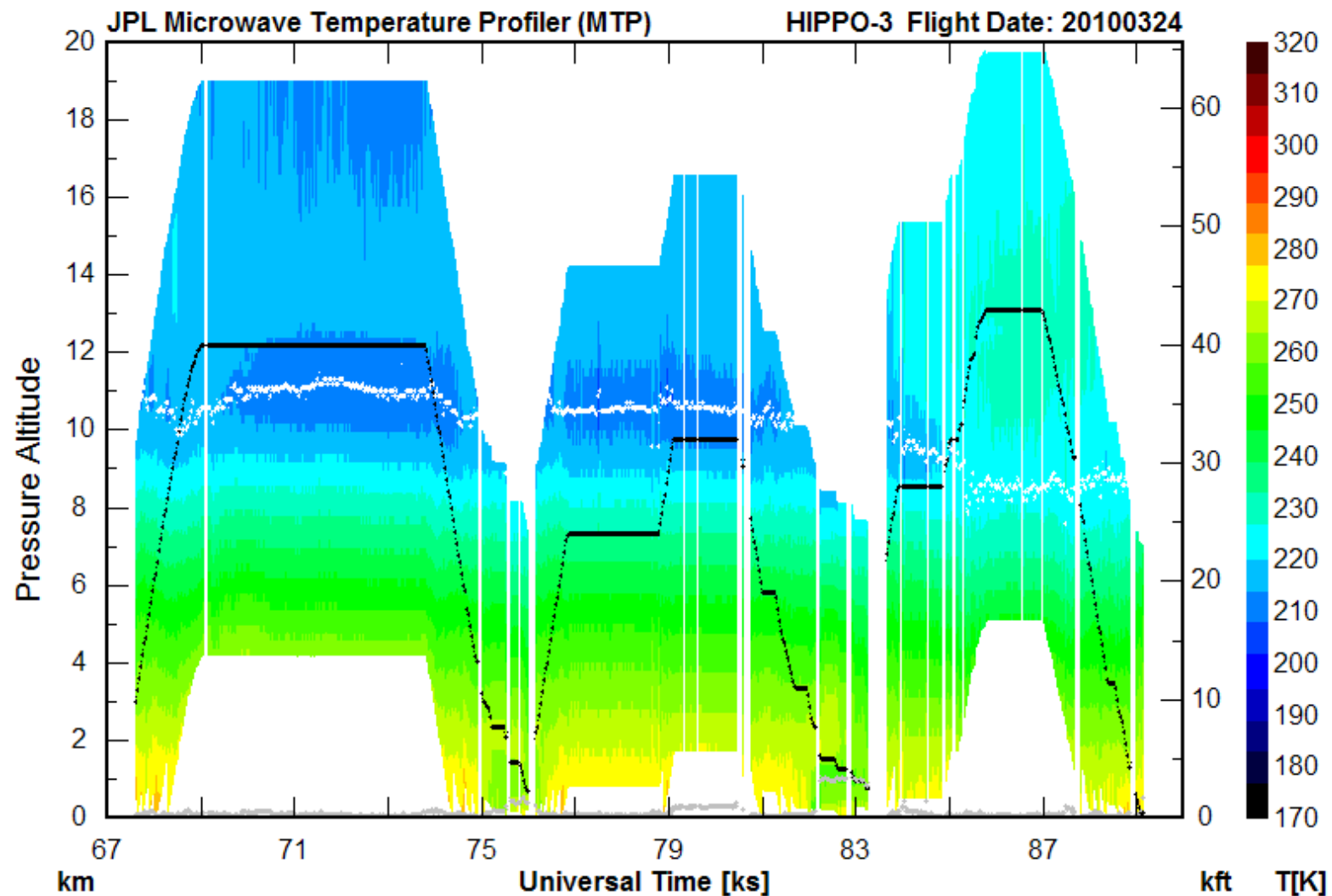
Data Status – HIPPO-3

- Processing complete, finishing documentation, submission imminent
- Quality good for most flights
 - RFI on Anchorage polar flight
 - Data gaps due to LO tuning problem on three flights
 - We have excluded data of questionable quality, but may be able to salvage missing portions upon request

<http://mtp.mjmahoney.net/www/missions/hippo-3/hippo-3.html>

HIPPO-3

RF01 – Broomfield to Anchorage

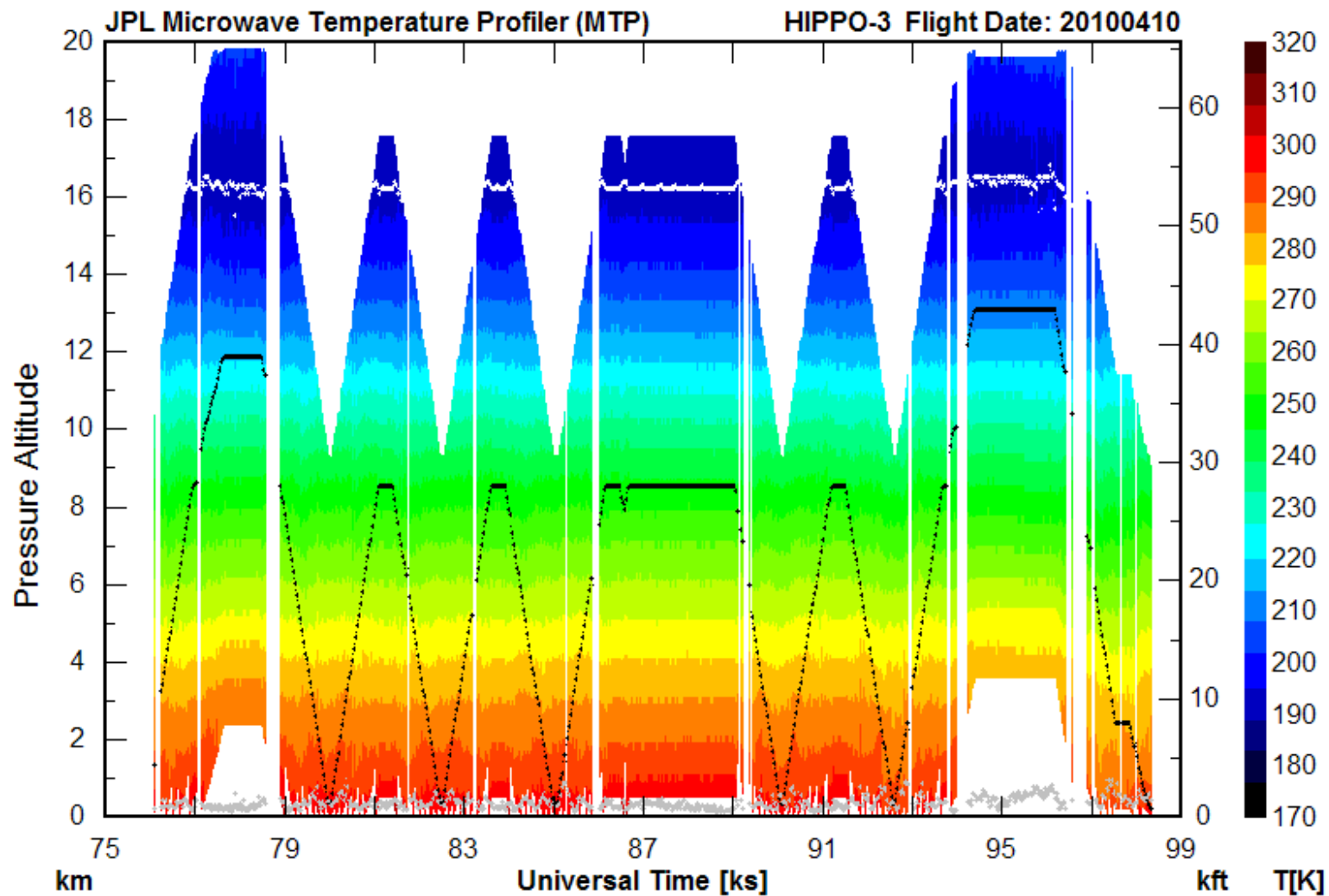


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Flight: 2010 03 24 00:00:00 Retrieved: 2011 02 16 11:30:07 Edited: 2011 02 16 12:01:13 Plotted: 2011 02 16

HIPPO-3

RFo8: American Samoa to Kona, HI



Principal Investigator: MJ Mahoney (Michael.J.Mahoney@jpl.nasa.gov)

Flight: 2010 04 10 00:00:00 Retrieved: 2011 02 16 11:47:38 Edited: 2011 02 21 17:41:14 Plotted: 2011 02 21

MTP Calibration Procedures

1. Raw Counts to Brightness Temperature

- Internal target provides 1 point relating brightness temperature to counts
- Aircraft in situ temperature provides 2nd point
→ calculate gains
 - We assess accuracy of in situ temperatures using raob fly-by's and use best temperature probe

2. Temperature Profile Retrieval

- Coefficients for (statistical) retrieval of temperature profiles in real-time calculated from historical radiosonde database before project
- Post-flight retrieval coefficients calculated from radiosonde near flight track

Instrument Changes during HIPPO

	Local Oscillator	LO Location	Frequencies Sampled
HIPPO-1	Unit 1 (noisy)	Back of canister	Wings of absorption lines
HIPPO-2	Unit 2 (borrowed)	Front of canister	Peak of absorption lines
HIPPO-3	Unit 3 (Gigatronics)	Back of canister	Peak of absorption lines (frequency collapse problem)
HIPPO-4	Unit 3 (Gigatronics)	Front of canister	Peak of absorption lines with revised command software
HIPPO-5	Same as HIPPO-4 unless new problems arise		