

King Air B200 Flight Report

Aircraft :	LaRC B-200 King Air (N529NA) (Operating as NASA529)
Operating Site(s) From / To :	Yellowknife to Thompson (R-151A: Fire work w/P-3) Thompson to Yellowknife (R-151B: HSRL enroute, CALIPSO)
Flight Date :	7/2/2008
Flight Number :	R-151AB
Take Off Time :	A: 0835 Local (MDT), 1435 UTC B: 1457 Local (CDT), 1957 UTC
Landing Time :	A: 1352 Local (CDT), 1852 UTC B: 1714 Local (MDT), 2314 UTC
Flight Time :	A: 4.3 hours B: 3.3 hours
Principal Investigator:	Rich Ferrare
Purpose of Flight :	Data [X] Ferry [] Functional Check [] Other []
Sensor Payload :	HSRL, Digital Camera, and RSP
Summary :	Fourth and fifth ARCTAS II research flights. Sampled smoke plumes in coordination with the P-3.

Objectives: Coordinated flight with P3 to

- Sample aged smoke downwind from fires
- Sample fresh smoke from strong fires in MISR swath

The B200 flew SE from Yellowknife to approximately 57.3 N, 103 W and from there flew south to meet the P3 for coordinated measurements of aged smoke. The B200 and P3 broke off the southward run at approximately 55.5 N and flew SE to a large fire at 54.19 N, 102.56 W. (Have yet to verify that the fire chose was within the MISR swath.) The B200 performed coordinated passes with the P3 along and across the plume of that fire. The B200 refueled at Thompson and returned to Yellowknife along a direct route at 20 kft rather than our nominal 28 kft due to strong head winds aloft.

The B200 was flying in cirrus at beginning of the first flight, making that portion of the flight useless for RSP retrievals. The cirrus cleared just as the P3 joined the B200 on the southward run. Skies above the aircraft were reported to be clear of cirrus above the aircraft for the remainder of the flight (with the exception of a contrail at 17:10 UTC), providing good observations for assessment of RSP and RSP-HSRL retrievals. During the orbits over the fire plume, the B200 performed a run that oriented RSP measurements along the principal plane.

On the second flight, returning from Thompson to Yellowknife, the B200 crossed the CALIPSO track about 1 hour after the CALIPSO overpass. At/near the point of crossing the CALIPSO track the HSRL indicated a strong smoke plume and should be an interesting case for comparison with CALIPSO.

The RSP and HSRL instruments worked well with the exception of a problem with the HSRL I2 calibration mechanism which jammed. This did not significantly affect the value of the data collected as the I2 calibration is extremely stable and easy to estimate from past flights. The problem was later diagnosed to be due to screw that had come loose and blocked the movement of the mechanism. The unit was repaired on the 5 July no-fly day.

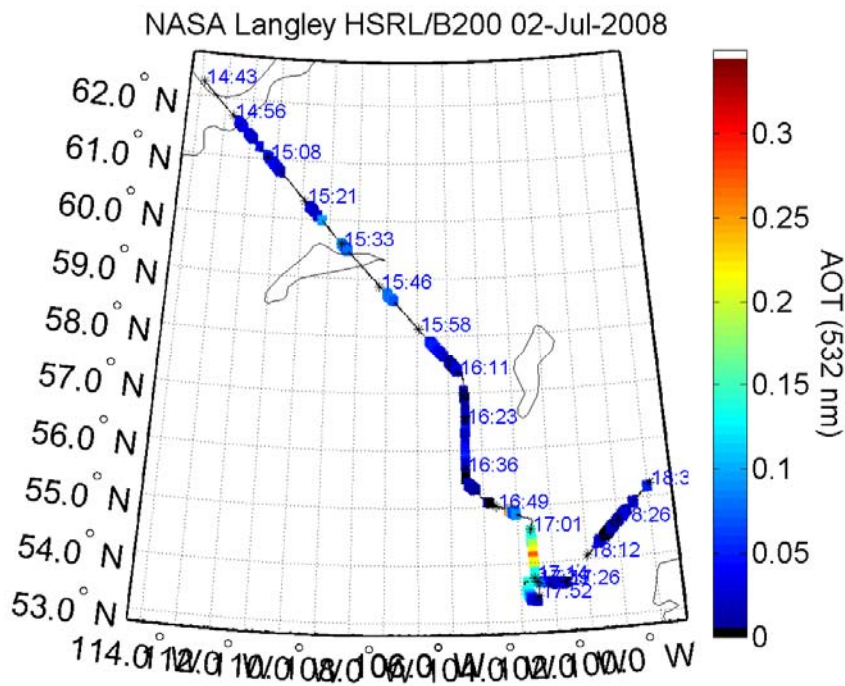


Figure 1. Flight track of B200 for flight 1.

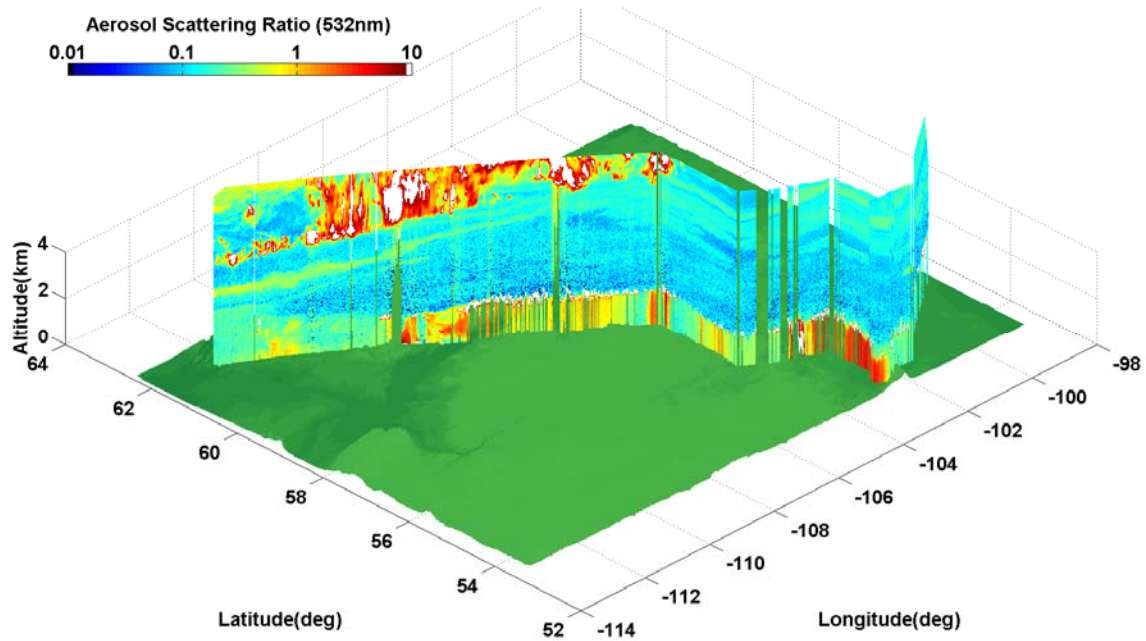


Figure 2. 3-D rendering of the 532 nm aerosol scattering ratio along the flight track for flight 1.

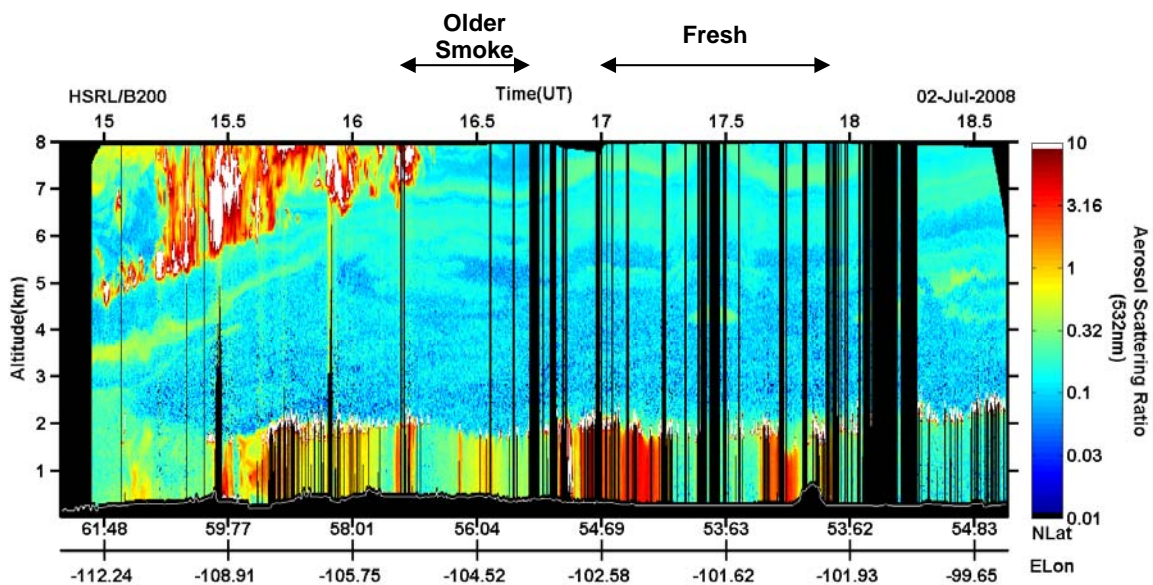


Figure 3. 532 nm aerosol scattering ratio for flight 1.

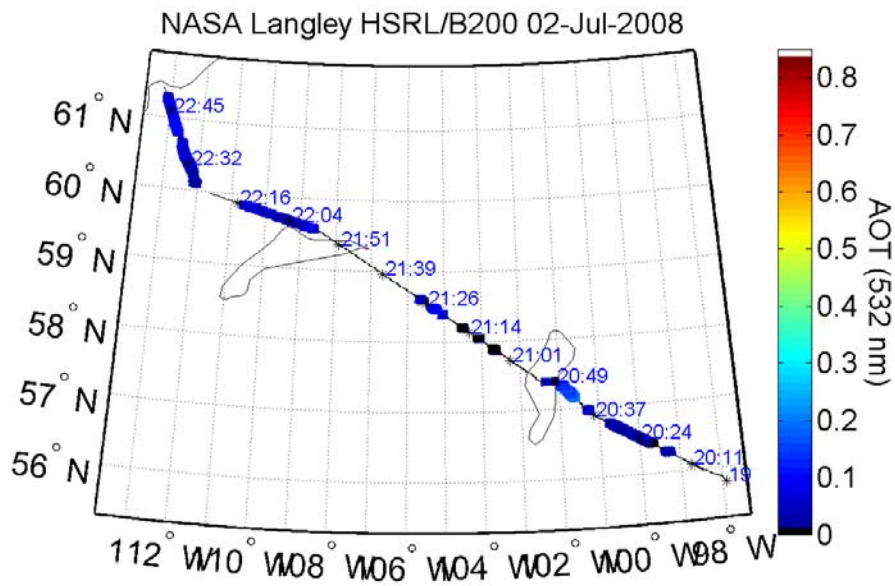


Figure 4. Flight track of B200 for flight 2.

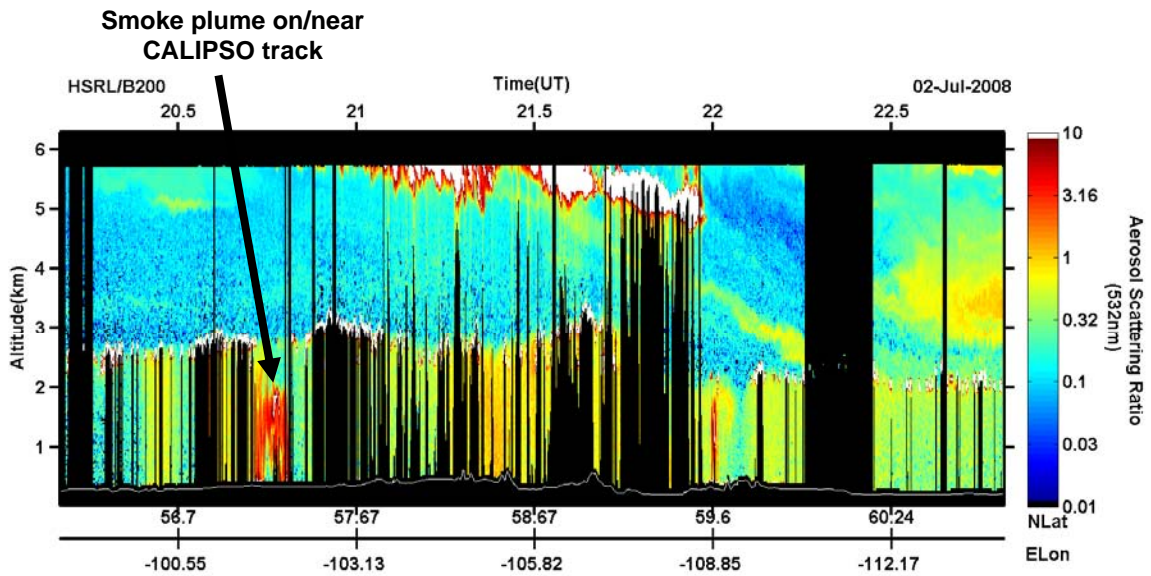


Figure 5. 532 nm aerosol scattering ratio for flight 2.