

Preliminary Science Flight Report

Operation IceBridge Arctic 2011



Flight: D08

Mission: Box 3 Flight 2

Flight Report Summary

Aircraft	LaRC B200 (NASA529)
Flight Number	D08
Flight Request	11-027 LaRC
Date	Wednesday, April 20, 2011 (Z)
Purpose of Flight	Monitor surface elevation in the southwestern part of Greenland, First dedicated flight in Box 3 grid (East of Nuuk).
Take off time	1036 Zulu from Kangerlussuaq (BGSF)
Landing time	1546 Zulu at Kangerlussuaq (BGSF)
Flight Hours	5.2
Aircraft Status	Airworthy.
Sensor Status	All installed sensors operational.
Significant Issues	None.
Accomplishments	<ul style="list-style-type: none"> • High-altitude survey (28,000 ft AGL) of the southwestern Greenland • Completed 2 ICESat Tracks in Box 3 and 1 in Box 4, Completed 10 km grid spacing in coastal portion of Box 3, Completed all ICESat tracks in Box 4. • LVIS and camera were operated on the survey lines. • 2 Ramp passes at 12000 and 18000 ft at BGSF. • 2 Pitch and Roll maneuvers over frozen fjord at BGSF
Geographic Keywords	Ice Sheet south western flank, East of Nuuk, Frederikshab Isblink
ICESat/CryoSat Track	70, 308
Repeat Mission	No

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
LVIS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	56 GB	None
LVIS Camera	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	16 GB	None
POS/AV	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2 GB	None

Mission Report (David Rabine, Instrument Operator and Lora Koenig, Mission Scientist)

Today's mission was the first mission dedicated mission to be flown in Box 3 which is located east of Nuuk, with Kavdlunatsait and Frederikshab Isblink on the coast at the boxes northern and southern end respectively. Previous grid lines had been flown in Box 3 on transits to Box 2. As shown in the satellite image (Figure 1) the region was clear of clouds. The flight was planned to survey 2 ICESat Tracks and 2 additional grid lines to complete a 10 km grid spacing from the coast. The flight also entered Box 4 following ICESat track 308 from Box 3 into Box 4 on the transit back to Kangerlussuaq. This track completed all ICESat Tracks in Box 4.

The B200 took off at 1036 Z from Kangerlussuaq and completed a pitch and roll and a ramp pass at 18,000 ft. The plane transited to the ICESat Track 70 in Box 3 and headed south west on the track for 182 nme before heading north and then south again on Box 3 grid lines. These grid lines completed a 10 km grid spacing from the coast that in subsequent missions will be filled in to 5 km. The B200 then headed north on ICESat Track 308 for 271 nmi from Box 3 into Box 4. This line completed all ICESat tracks in Box 4 and left 1 additional ICESat Track to complete in Box 3. The plane landed at Kangerlussuaq at 1546 Z. Upon landing the plane lost pressure in the nose tire. The crew went onto the runway to assist the plane and changed the nose tire in sub freezing temperatures in 23 minutes. The plane taxied to the hanger. The plane will undergo a full inspection this evening. At this point the plane is expected to be fully operational for flights tomorrow.

LVIS had clear skies and did not see any loss of the signal during the flight due to clouds.

Figure 3 below shows the coverage to date of the LVIS/ B200 grids line from this campaign.

Below are the detailed Flight notes from the Instrument Operator. Times from the Instrument Operator on the plane are in local Kangerlussuaq time (-2 hours from Z)

2011/04/20 (Happy Anniversary to Me and Christine!)

GPS Day 110 (DOW=3 Wednesday) GPS Week 608+1024 = 1632

Pilot = Rick Yasky, Co-Pilot-Seat = Luci Crittenden, David Rabine in the back.

Will attempt 10k roll and pitch, and 18k airport overpass. ATC Clearance is only to 18k for now due to traffic, hopefully we can get higher soon.

09:03 Camera did not come up for roll and pitch or runway pass (got runway at 18k).

09:23 60kt cross wind today, almost at line start. Free data crossing the box north of here as we came over to line up for this data run.

10:22 Set RX Thresh 70, we were missing laser shots during the transmissions to ATC (noise above threshold). It appears solid data only now.

10:39 First line, the auto pilot was being a little trouble, but appears to be cooperating better for second half and then this line two is good.

11:46 Thin cirrus clouds ~ 29k (just above us) and to the right, but no instrument impact

11:54 Looks like some thicker clouds at or above our level to the south, so this was about as far south as we should have gone today (good call again!)

13:02 Turned down the fiber attenuation a bit, channel B was getting into saturation.

13:09 Lots of crossing future lines as we descend into BGSF. Lower altitude than normal though, as we head to 12,000 feet.

13:?? Roll and pitch after runway pass at 12,000 feet

13:?? Total data collected 15.7 GB of camera, 56GB of LVIS

13:48 Blew a nose tire we think on landing.

14:08 Tire changed on the runway, Applanix got ~ 15 minutes on the UPS then I spun it down while they jacked the front and replaced nose wheel. GPS got ~ 24 minutes of mostly static.. I'll keep them running until we pull into hangar.

Individual instrument reports from experimenters on board the aircraft:

LVIS: Worked well, ~99% or better coverage, there was continued radio interference on transmit from some radio transmission. The interference should not cause any significant problem to the altimetry data.

LVIS Camera: Worked well, was not operating on roll and pitch and ramp at beginning of flight.

POS/AV: Worked well, no issues.

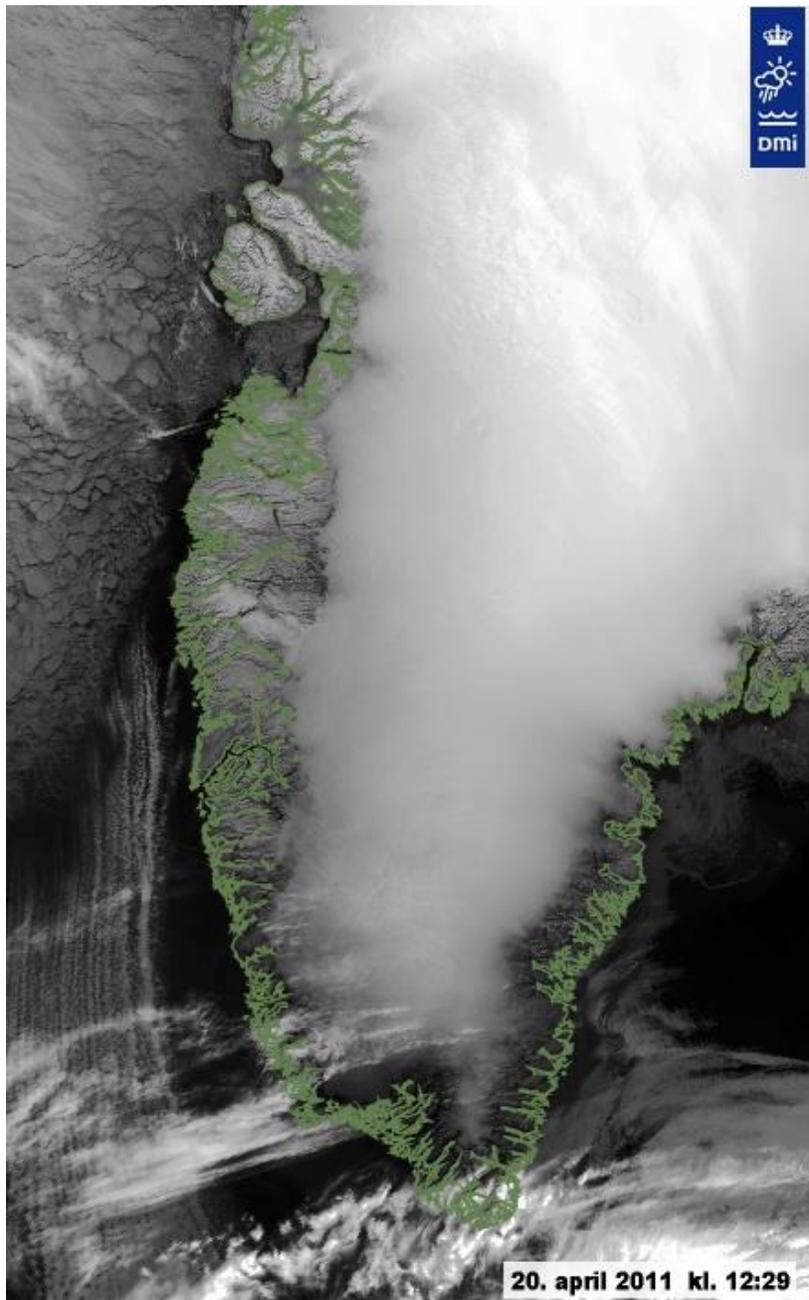


Figure 1: IR Satellite image taken during the flight.

box3_420 option

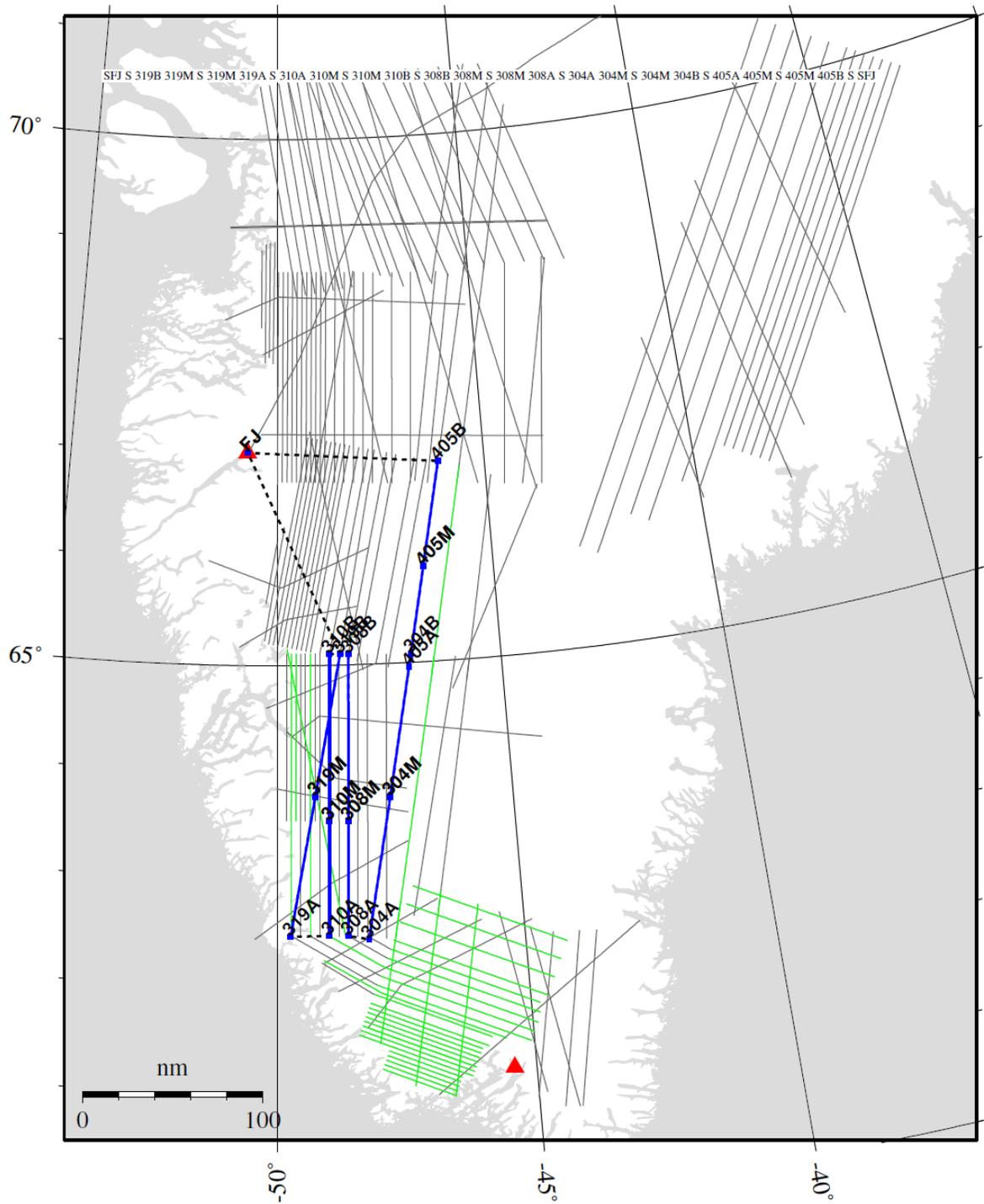


Figure 2: Proposed B200 flight plan for April 20, 2011 (blue). Green lines are previously flown lines.

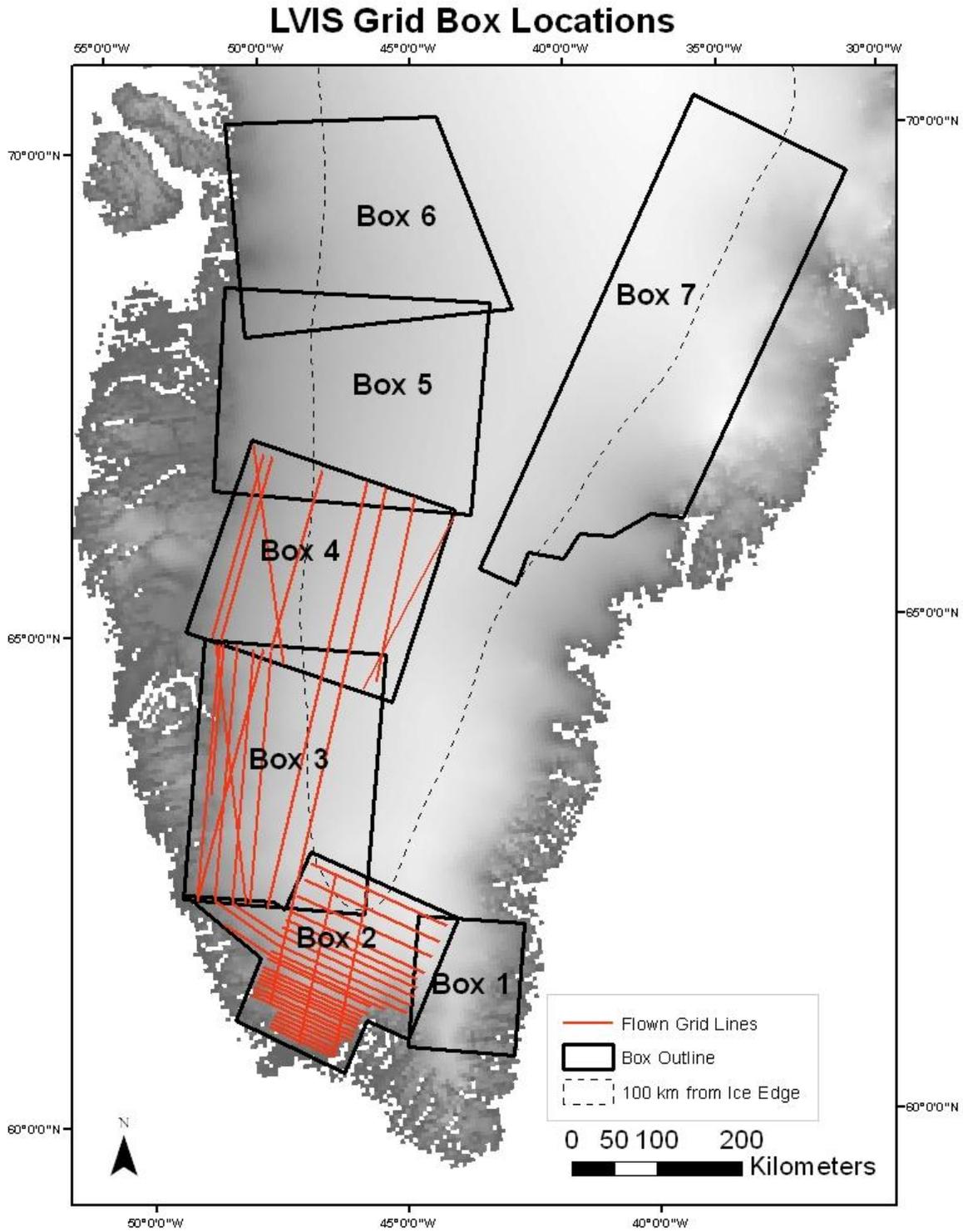


Figure 3: LVIS grid lines flown to date during the B200 Arctic 2011 Operation IceBridge Campaign.