

# Preliminary Science Flight Report

## Operation IceBridge Arctic 2011



**Flight: D03 and D04**  
**Mission: Box 2 Flight 2**

### Flight Report Summary

<b>Aircraft</b>	<b>LaRC B200 (NASA529)</b>
<b>Flight Number</b>	D03 and D04
<b>Flight Request</b>	11-024 LaRC
<b>Date</b>	Friday, April 16, 2011 (Z)
<b>Purpose of Flight</b>	Monitor surface elevation in the southern most part of Greenland, fill in the Box 2 grid (West of Narsarsuaq) obtaining a 10 km grid in the middle of the box and a 20 km grid in the interior of the box. Transit along coastal lines in Box 3.
<b>Take off time</b>	1023 Zulu from Kangerlussuaq (BGSF); 1544 Zulu from Narsarsuaq (BGBW)
<b>Landing time</b>	1451 Zulu at Narsarsuaq (BGBW); 1812 Zulu at Kangerlussuaq (BGSF)
<b>Flight Hours</b>	7
<b>Aircraft Status</b>	Airworthy.
<b>Sensor Status</b>	All installed sensors operational.
<b>Significant Issues</b>	None
<b>Accomplishments</b>	<ul style="list-style-type: none"> <li>• High-altitude survey (28,000 ft AGL) of the southern tip of Greenland west of Narsarsuaq.</li> <li>• 10 km grid spacing in the middle of Box 2 and 20 km in interior.</li> <li>• LVIS and camera were operated on the survey lines.</li> <li>• Ramp pass at 12000 ft at BGSF.</li> <li>• Pitch and Roll maneuvers over frozen fjord at BGSF and over open water fjord at BGBW.</li> </ul>
<b>Geographic Keywords</b>	Narsarsuaq, Southern Greenland, Kangiata Nurata Sermia, Narsap Sermia, Ice Sheet South western flank.
<b>ICESat/CryoSat Track</b>	None
<b>Repeat Mission</b>	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"/>	~80 GB	None
LVIS Camera	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	~15 GB	None
POS/AV	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	~2 GB	None

### Mission Report (Shane Wake, Instrument Operator and Lora Koenig, Mission Scientist)

Today's mission was designed to fill in Box 2 at 10 km in the middle of the box and 20 km in the ice sheet interior portion of the box. As shown in the satellite image below the weather was nearly identical to yesterday's flight (April 15, 2011) so we again worked at filling in the grid lines in Box 2, west of Narsarsuaq. We planned and approximately 5 hour flight to Narsarsuaq and a 2.5 hour flight back in order keep the flights within the hours of the Kangerlussuaq airport.

The B200 was ready for departure as soon as the airport opened at took off at ~1023 Z. The plane transited to southern Greenland along a grid line in Box 3. Upon reaching Box 2 the plane flew grid lines to create a 10 km grid spacing in the center of the box and a 20 km grid spacing in the ice sheet interior portion of the box. The plane flew a crossing line across the grid lines on its approach into the airport.

The plane landed (1451 Z) and refueled at Narsarsuaq. After takeoff (1544 Z) in Narsarsuaq the plane flew a mid-box grid line in Box 2 to densify the grid and transited North on a coastal grid line in Box 3 that crossed Kangiata Nurata Sermia and Narssap Sermia. The plane Landed at Kangerlussuaq at approximately 1812 Z. The flight planning estimated this flight at 7.2 hours and it was completed in 7.0. The B200 flight plans after 2 days of flying appear to predict the flight time very well.

Figure 4 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)

#### Operator (Shane Wake) Flight Notes OIB Greenland 2011

07:00 Plane is being pulled out of the hangar, 20hz Javad's GPS started after plane stationary  
 07:18 Started up system to check status, everything looks good  
 07:34 Applanix 510 & 610 are turned on along with 100 Hz Javad GPS  
 08:00 Buttoned up and ready to fly.  
 ~08:15 Switched from ground power to engine  
 08:20 Take off  
 08:25 Runway pass at 12000ft  
 08:30 Performed roll and pitch maneuvers over fjord  
 08:32 Cannon Camera Turned on  
 Took data for flight lines of Box 2 Flight 2, nearly 100% collection achieved  
 Landed at Narsarsuaq, pilot had to roll up to 20 deg due to wind conditions on landing approach  
 Did ~2 minutes power on before spinning down Applanix units

Refueled

Downloaded the first file of the 100hz Javad GPS for faster downloading after mission

Performed a roll and pitch maneuver over the fjord immediately after takeoff

Collected data for return flight lines, nearly 100% data collection achieved

15:58 performed runway pass over Sondrestrom (sp?)

16:02 Performed roll and pitch maneuvers over fjord

Landed

16:18 plane stationary on ramp for GPS positioning

**Individual instrument reports from experimenters on board the aircraft:**

**LVIS:** Worked well, there was interference received from random radio transmissions.

**LVIS Camera:** Worked well, no issues.

**POS/AV:** Worked well, no issues.

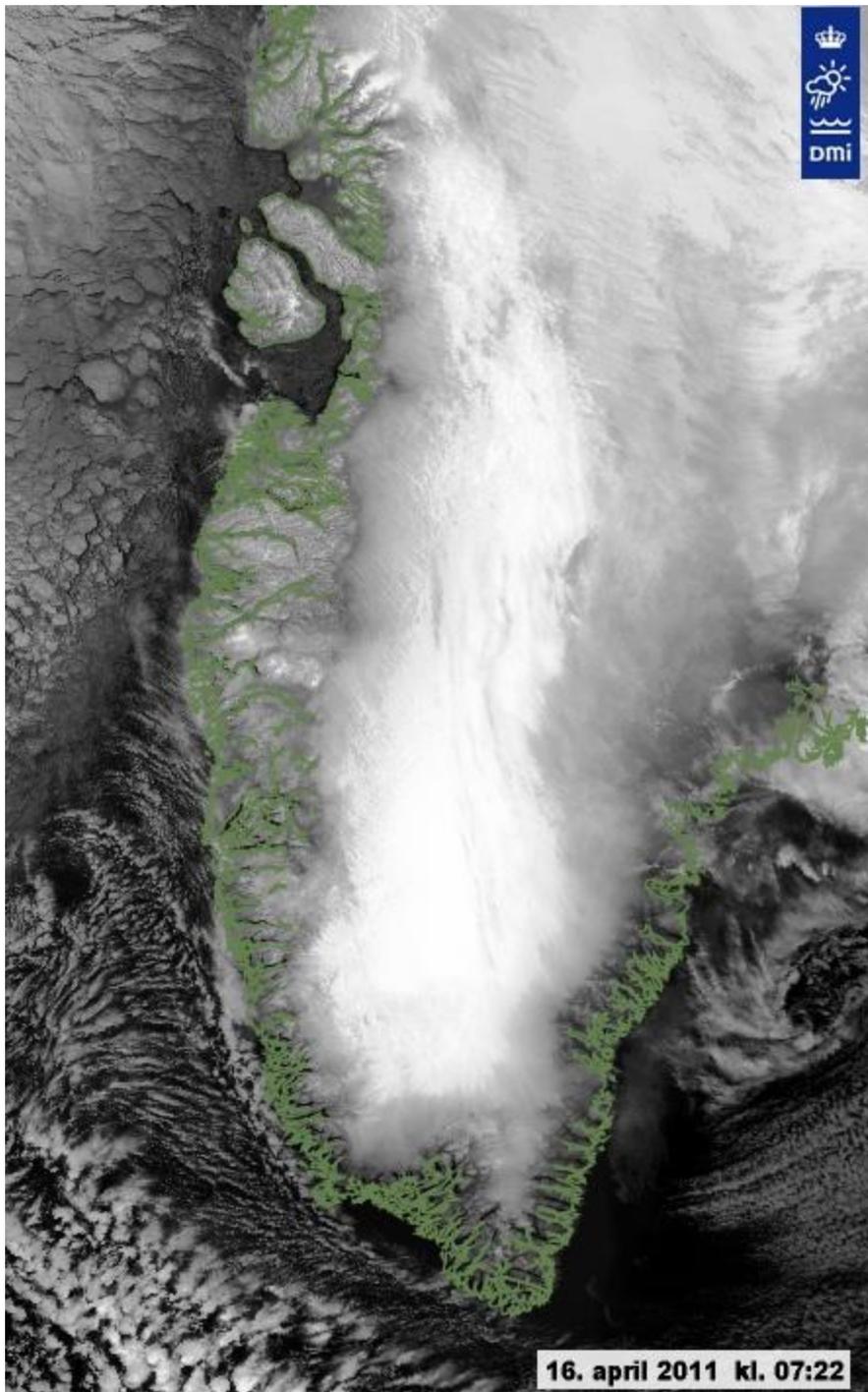


Figure 1: IR Satellite image taken ~1 hour before mission take off time.

box2\_5555 option

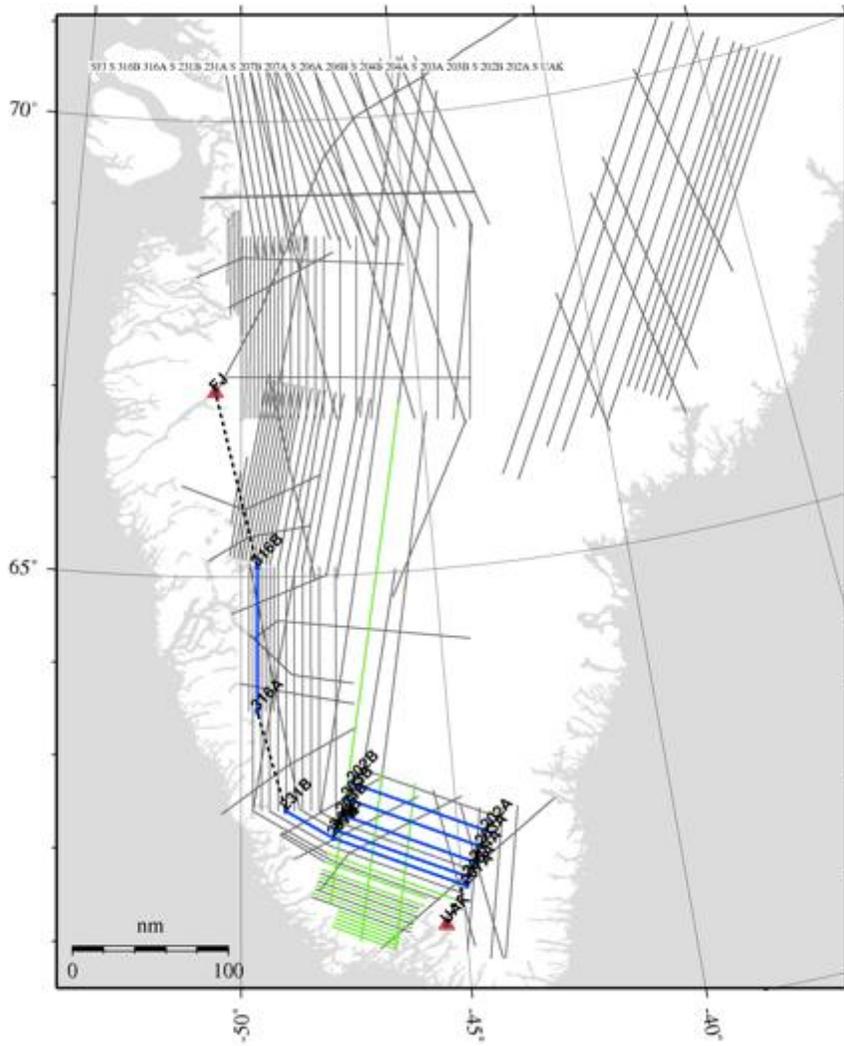


Figure 2: Proposed flight plan from Kangerlussuaq to Narsarsuaq in blue. Green lines have been flown.

box2\_416B option

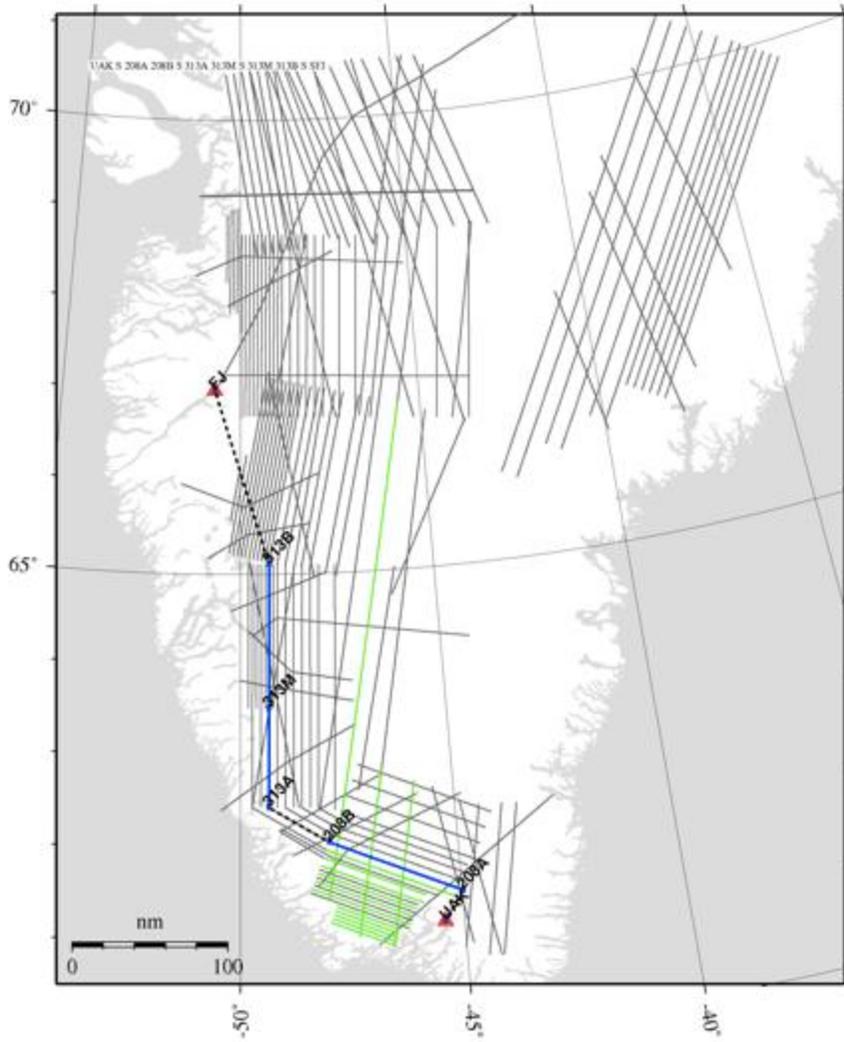


Figure 3: Proposed flight plan from Narsarsuaq to Kangerlussuaq in Blue. Green lines have been flown.

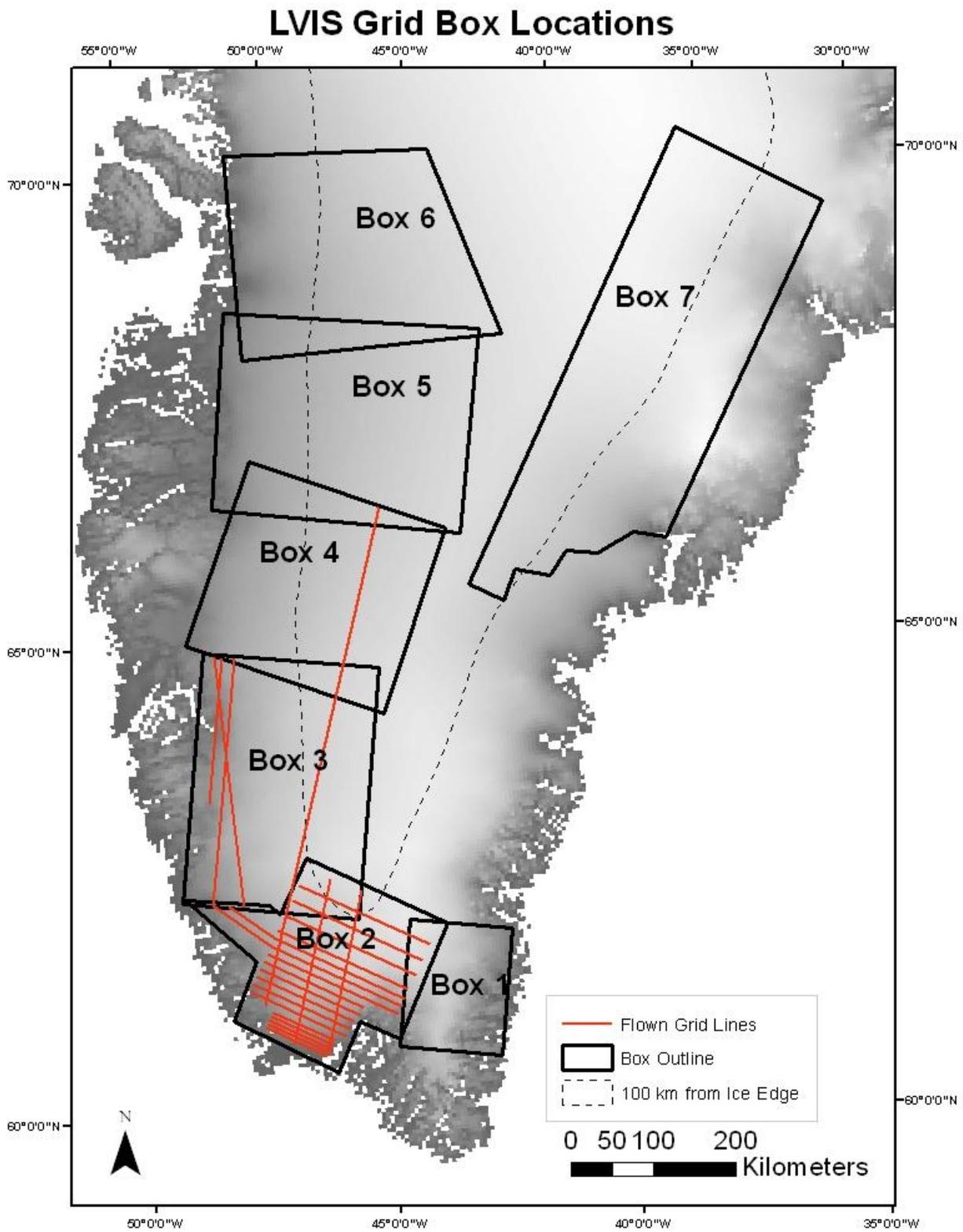


Figure 4: LVIS grid lines flown to date during the B200 Arctic 2011 Operation IceBridge Campaign.