
Science Flight Report

Operation IceBridge Arctic 2012



Flight: Falcon 06
Mission: Saqqap+Narsap glaciers

Flight Report Summary

Aircraft	Falcon (HU-25) N525
Flight Number	Falcon 06
Flight Log number	12F001
Date	Thursday, May 3, 2012 (Z)
Purpose of Flight	Detailed survey of Saqqap and Narsap glaciers
Take off time	1015 Zulu at Kangerlussuaq
Landing time	1400 Zulu at Kangerlussuaq
Flight Hours	3.9 hours
Aircraft Status	Airworthy.
Sensor Status	All installed sensors operational.
Significant Issues	We used an unusual racetrack flight path to cover two parallel glaciers separated from each other by about 70 km. The use of a racetrack meant that we flew down one glacier, then transited to the other, flew up it, transited back to the first, then flew down the first with a nominal 1 km offset from the first pass, and so forth, until we completed six adjacent tracks over Saqqap and five over Narsap, thus covering the cores of both glaciers. For the turns, because of the possibility that the GPS could lose lock at bank angles greater than 15 degrees, the pilots had to fly the turns by hand, and go in and out of autopilot as they exited one glacier and entered the other. Because of the skill of the pilots, this procedure produced a good set of adjacent lines over the two glaciers.
Accomplishments	• First laser survey of these glaciers
Geographic Keywords	Greenland, Saqqap, Narsap glaciers
Satellite Tracks	none
Repeat Mission	none

Science Data Report Summary

Instrument	Data Volume			Instrument Issues
	Survey Area	Entire Flight		
LVIS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	37 GB	None
LVIS cameras	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	54 GB	None

Mission Report (Seelye Martin, Acting Project Manager)

This is a high resolution survey of the Saqqap and Narsap glaciers, which is a project ranked “High” by the ice sheet science team. Satellite data suggests that both glaciers are thinning. This was a difficult weather call, with coastal fog predicted to burn off in the morning, and high thin clouds predicted to move into the area of interest, also in the morning. We made the assumption that we were sufficiently inland from the coast that fog was unimportant, and did an early launch to minimize high clouds. Although high clouds were present in the area, the instrument was still able to see the laser reflection from the surface through the clouds. The racetrack design for coverage of both glaciers also worked well, in spite of the necessary switch from auto-pilot to hand control for each turn. Preliminary examination of the data shows that we obtained good data from the two glaciers. Each of the survey lines are about 100 km long; we flew six for the upper Saqqap glacier, and five for the lower Narsap glacier. The total mission length was 2,753 km. We include below two images: the flight track and a first look at the processed elevation data.

Individual instrument reports from experimenters on board the aircraft:

LVIS: The LVIS system worked well and collected data for the majority of the flight.

LVIS-cameras: worked well, although with some degradation by clouds.

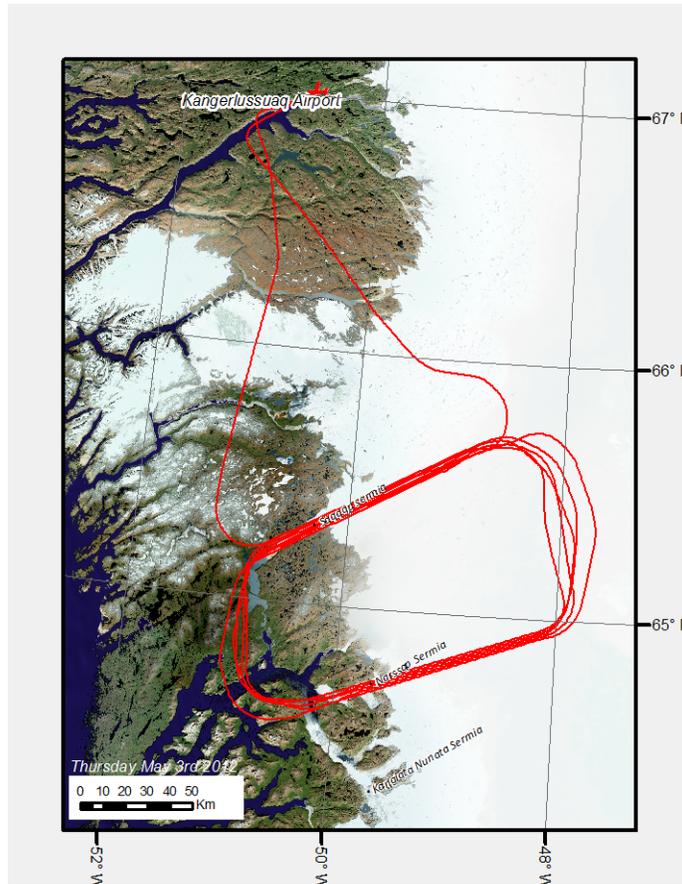
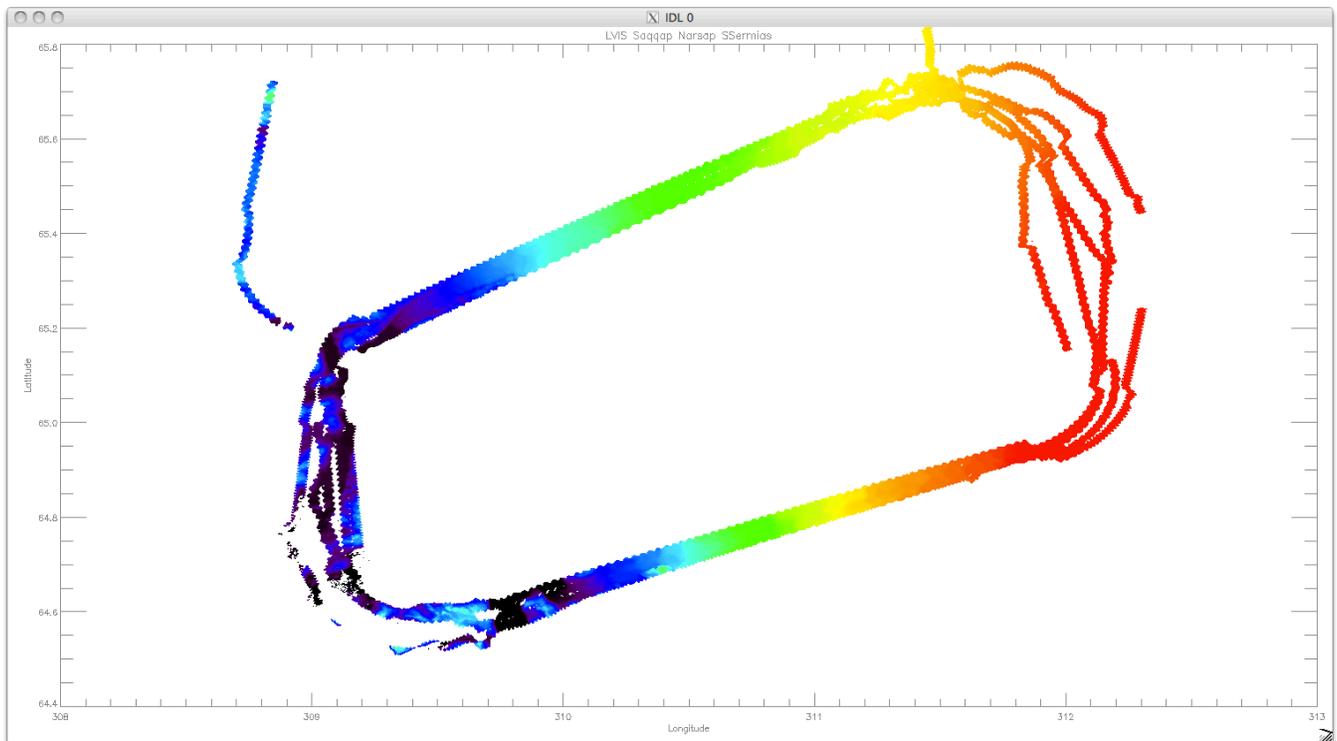


Figure 1: racetrack survey lines for Saqqap and Narsap glaciers.



A first look at the processed data, with the coast to the left. The gaps in the lines occur when the aircraft roll exceeds 7 degrees. The hotter colors are higher elevations; the glaciers go from sea level to 2,500 m. The image shows how well the racetrack flight lines defined the glaciers.