

SEAC4RS - Other: Learjet 25 - Ice Niner 08/12/13 Science Report

Aircraft: Other: Learjet 25 - Ice Niner - 13M304

Date: Monday, August 12, 2013

Mission: SEAC4RS

Mission Location: NorthWestern Alabama

Mission Summary:

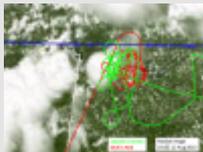
The SPEC LearJet landed and refueled in Huntsville, Alabama in preparation for the science flight. Take off out of Huntsville at 18:43 UTC. Coordination between the DC-8 and SPEC LearJet was attained in and around an isolated convective cloud over Muscle Shoals, Alabama ~1900-2000Z. The same cloud was sampled from its beginning stages to its maturity at ten altitude levels, including several penetrations of the anvil. All cloud probe instruments on the DC8 and LearJet captured data for this flight, covering a range of particle sizes from 0.5microns up to several millimeters. Two probes (the 2D-S and FCDP) were not installed on the LearJet for this flight, but there is some redundancy with those measurements since the Hawkeye probe includes both a 2D-S and a FCDP. The Hawkeye-CPI on the LearJet was not performing optimally; the captured frames per second (normally at least 200/s in liquid clouds) dropped to ~10 fps after a few minutes in flight, which will be remedied before the next science flight.

Here is a short summary on the cloud penetrations (written by Roelof Bruitjes):

1. On our ascent out of Huntsville we penetrated clouds from cloud base to 15kft where we leveled off. Cloud base was around 4000ft and +20C
2. The cloud that was selected was a growing Cu Congestus at the start and was growing rapidly through our level at the time of initial penetrations. Large drops were observed below the 0C level indicating that coalescence was active in the warm part of the cloud.
3. We ascended with the cloud top and did multiple penetrations on the way up at -6C, -12C and -16C. First graupel and ice was detected at -6C with an active secondary ice process ongoing. There was rapid glaciation between -6 and -15C.
4. Several penetrations were conducted in the glaciated parts. After the rapid glaciation the cloud seemed to get another growth pulse and we broke off one penetration at that time when the aircraft radar painted a red area in the cloud.
5. We subsequently ascended to the anvil area and did several penetrations in the anvil. It was interesting to see from the particle images that much of the ice nucleated at the -6C Level made it into the anvil. Penetrations were done at -18, -24, -32 and the coldest at -38C.

Images:

SPEC LearJet and DC8 Flight Tracks during coordination



[Read more](#)

Submitted by: Sara Lance on 08/21/13

Related Flight Report:

Other: Learjet 25 - Ice Niner 08/12/13

Flight Number: 20130812b

Payload Configuration: SEAC4RS - 2013

Nav Data Collected: Yes

Total Flight Time: 1.8 hours

Submitted by: Sara Lance on 08/31/13

Flight Segments:

From:	HSV (Huntsville, AL)	To:	HSV (Huntsville, AL)
Start:	08/12/13 18:34 Z	Finish:	08/12/13 20:21 Z
Flight Time:	1.8 hours		

Log Number:	13M304	PI:	Paul Lawson
Funding Source:	Hal Maring - NASA - SMD - ESD Radiation Science Program		
Purpose of Flight:	Science		

Flight Hour Summary:

	13M304
Flight Hours Approved in SOFRS	60
Total Used	59.5
Total Remaining	0.5

13M304 Flight Reports						
Date	Flt #	Purpose of Flight	Duration	Running Total	Hours Remaining	Miles Flown
08/06/13	20130806a	Ferry	1.2	1.2	58.8	
08/06/13	20130806b	Ferry	1.1	2.3	57.7	
08/09/13	20130809	Ferry	1.1	3.4	56.6	
08/11/13	20130811	Check	1.3	4.7	55.3	
08/12/13	20130812a	Transit	1.8	6.5	53.5	
08/12/13	20130812b	Science	1.8	8.3	51.7	
08/12/13	20130812c	Transit	1.7	10	50	
08/18/13	20130818	Check	0.7	10.7	49.3	
08/21/13	20130821a	Transit	1.7	12.4	47.6	
08/21/13	20130821b	Science	2.2	14.6	45.4	
08/21/13	20130821c	Transit	2.1	16.7	43.3	
08/23/13	20130823a	Transit	1.2	17.9	42.1	
08/23/13	20130823b	Science	2	19.9	40.1	
08/30/13	20130830a	Transit	1.7	21.6	38.4	
08/30/13	20130830b	Science	1.9	23.5	36.5	
08/30/13	20130830c	Transit	1.9	25.4	34.6	
09/02/13	20130902a	Transit	1.2	26.6	33.4	
09/02/13	20130902b	Science	2	28.6	31.4	
09/02/13	20130902c	Transit	1.2	29.8	30.2	
09/04/13	20130904a	Transit	1.3	31.1	28.9	
09/04/13	20130904b	Science	1.7	32.8	27.2	
09/04/13	20130904c	Transit	1.2	34	26	
09/06/13	20130906	Check	1.9	35.9	24.1	
09/09/13	20130909a	Science	1.6	37.5	22.5	
09/09/13	20130909b	Science	1.5	39	21	
09/10/13	20130910	Pilot Proficiency	0.5	39.5	20.5	
09/11/13	20130911d	Transit	1.4	40.9	19.1	
09/11/13	20130911a	Transit	1.3	42.2	17.8	
09/11/13	20130911b	Science	1.7	43.9	16.1	
09/11/13	20130911c	Science	1.7	45.6	14.4	
09/16/13	20130916	Science	1.9	47.5	12.5	
09/17/13	20130917	Science	2.1	49.6	10.4	
09/18/13	20130918a	Science	2.3	51.9	8.1	
09/18/13	20130918b	Science	2.4	54.3	5.7	
09/18/13	20130918c	Transit	1.1	55.4	4.6	
09/22/13	20130922a	Science	1.7	57.1	2.9	
09/22/13	20130922b	Ferry	2.4	59.5	0.5	

Flight Reports began being entered into this system as of 2012 flights. If there were flights flown under an earlier log number the flight reports are not available online.

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