



*Supplement of*

**Deep Convective Microphysics Experiment (DCMEX) coordinated aircraft and ground observations: microphysics, aerosol, and dynamics during cumulonimbus development**

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**Table S1**

Below are noted the known issues with the FAAM aircraft instrument operation during the campaign

Instrument	Operation notes
AIMMS	May have iced up for approx 10 min on 22nd July 18:20:30
CIP100	Significant image noise on the 23rd and 24th July
PCASP	On the 16th July, 10Hz resulted in numerous communications dropouts that are flagged in data. 5Hz measurement from 19th can still lead to occasional dropouts and concentration spikes.
non-deiced temperature	There were times when this probe suffered from icing should be automatically flagged in the data.
CPC (aka CPC-a)	There were some data losses on the 20th and 23rd July, and 1st August

Table S2		Key	operational	Partially operational / more analysis required	Not operational							
		Manchester cloud physics aircraft instruments					Manchester aerosol aircraft instruments					Leeds aircraft
Date	Flight number	2DS	3VCPI	HVPS-3	HALOHOLO	BCP-D (Operated by FAAM)	AMS	LAAP-TOF	SP-2	GRIMM (CVI)	CPC (CVI) (aka CPC-b)	INP filters
16/07/2022	C297					Full analysis required to see if any useful data can be retrieved.	pump overheated	vacuum pressure issue				
19/07/2022	C298						operational error	vacuum pressure issue				Only PTFE filters collected
20/07/2022	C299							laser alignment issue		incomplete data	incomplete data	Only PTFE filters collected
22/07/2022	C300											
23/07/2022	C301		2DS Image Noise					From now, available data in both aerosol mode and cloud residuals		From now, available data in both aerosol mode and cloud residuals	From now, available data in both aerosol mode and cloud residuals	
24/07/2022	C302									incomplete data	incomplete data	
25/07/2022	C303											
26/07/2022	C304						pump overheated	From now, Excimer laser safety issue				
27/07/2022	C305								From now, available data in both aerosol mode and cloud residuals			
29/07/2022	C306											
30/07/2022	C307						From now, available data in both aerosol mode and cloud residuals					
31/07/2022	C308	Rack power supply issue	Low CPI laser voltage						Rack power supply issue			
01/08/2022	C309											
02/08/2022	C310											
03/08/2022	C311						Time of flight Power Supply issue					
04/08/2022	C312						Time of flight Power Supply issue					
06/08/2022	C313											
07/08/2022	C314											
08/08/2022	C315						Turbo pump issue					

Table S3		Key	operational	Partially operational / more analysis required	Not operational								
Supplementary table 3													
		Oklahoma radar		NMT langmuir		Manchester Main laboratory	Manchester Kiva 2	Manchester Langmuir			Leeds langmuir	Leeds Socorro and Magdalena	
Date	Flight number	PX1000	SR1	E-field mill	LEFA	Weather Station	Weather Station	Aerosol PSD GRIMM	Aerosol PLAIR Rapid-Eplus	Digitel	Camera 1	Camera 2	
15/07/2022	no flight						from 03:41	Installed			testing	testing	
16/07/2022	C297		16:30-18:50						Installed				
17/07/2022	no flight									Installed and sampling			
18/07/2022	no flight					from 21:53			Maintenance		testing	testing	
19/07/2022	C298		15:40-17:23	distant lightning 22:03-23:59	distant lightning 22:03-23:59								
20/07/2022	C299												
21/07/2022	no flight			T-storm 02:44-04:00									
22/07/2022	C300										Images from 19Z only		
23/07/2022	C301	16:20-22:32		T-storm 18:31-20:00	T-storm 19:21-20:21					Filter stack changeover			
24/07/2022	C302	15:51-20:14		T-storm 05:30-07:30									
25/07/2022	C303	15:48-21:05		T-storm 17:45-18:30	T-storm 17:58-19:00								
26/07/2022	C304	16:00-19:59		T-storm 19:42-20:30	T-storm 19:50-20:50								
27/07/2022	C305	16:00-20:15		T-storm 16:45-20:00	T-storm 17:44-18:44								
28/07/2022	no flight			T-storm 17:40-21:30	T-storm 19:50-23:50					Filter stack changeover - pump did not start up again			
29/07/2022	C306	15:51-20:05	16:15-17:39 and 18:55-19:15	A couple flashes 19:40-19:50									
30/07/2022	C307	15:53-20:17	16:55-20:13	T-storm 17:12-20:00	Tstorm 17:34-21:43								
31/07/2022	C308	16:07-20:07	17:50-18:30	T-storm 18:34-23:00	T-storm 18:44-23:59								
01/08/2022	C309	15:59-20:26	17:00-18:38 and 19:35-20:08										
02/08/2022	C310	15:54-20:22	19:02-19:20 and 19:45-20:08		data 21:00-23:00								
03/08/2022	C311	15:56-17:59		T-storm 21:44-22:00	T-storm 21:47-22:46								
04/08/2022	C312	16:36-23:01											
05/08/2022	no flight		Troubleshooting							Filter stack changeover			
06/08/2022	C313	16:04-20:13	18:20-19:28	T-storm 18:34-19:00	Data 19:04-20:04								
07/08/2022	C314	16:57-23:23	18:05-18:48 and 19:25-20:13	T-storm 18:12-19:38	T-storm 18:41-20:41				Maintenance				
08/08/2022	C315	16:32-19:27	17:48-18:20		Data 22:37-23:59								