

**Supplementary table 1**

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	There were some data losses on the 20th and 23rd July, and 1st August

Supplementary table 2		Key	operational	Partially operational / more analysis required	Not operational								
Date	Flight number	Manchester cloud physics aircraft instruments					Manchester aerosol aircraft instruments						Leeds aircraft
		2DS	3VCPI	HVPS-3	HALOHOLO	BCP-D (Operated by FAAM)	AMS	LAAP-TOF	SP-2	GRIMM (CVI)	CPC (CVI)	UHSAS (CVI)	INP filters
16/07/2022	C297					Full analysis required to see if any useful data can be retrieved.	pump overheated	vacuum pressure issue					Full analysis required to see if any useful data can be retrieved.
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	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		From now, available data in both aerosol mode and cloud residuals			
27/07/2022	C305												
29/07/2022	C306												
30/07/2022	C307												
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					

