Lead Project Scientist

Storm or Project Hurricane Harvey **Experiment type** TDR
Flight ID 170825H1 **Mission ID**

Preflight

- ✓ 1. Participate in general mission briefing.
- ✓ 2. Determine specific mission and flight requirements for assigned aircraft from the Field Program Director.
- ✓ 3. Contact HRD members of crew to:
  a. Assure availability for mission.
  b. Review field program safety checklist
  c. Arrange ground transportation schedule when deployed.
  d. Determine equipment status.
- ✓ 4. Meet with AOC flight director and navigator at least 3 hours before take-off for initial briefing.
- ✓ 5. Determine from AOC flight director the mission designation and whether aircraft has operational fix responsibility.
- ✓ 6. Meet with AOC flight crew at least 2 hours before take-off for crew briefing. Provide copies of flight requirements and provide a formal briefing for the flight director, navigator, and pilots.
- ✓ 7. Report status of aircraft, systems, necessary on-board supplies and crews to Field Program Director.
- ✓ 8. Before take-off, brief the on-board GPS dropsonde operator on times and positions of drops.
- ✓ 9. Make sure each HRD flight crew member has a life vest.
- ✓ 10. Perform a headset operation check with all HRD flight crew members. Make sure everyone can hear and speak using the headset.

In-Flight

- ____ 1. Confirm from AOC flight director that satellite data link is operative (information).
- ____ 2. Confirm camera mode of operation.
- ____ 3. Confirm data recording rate.
- ____ 4. Request AOC flight director to leave radar in non-sector mode for initial Figure 4.
- ____ 5. Once at IP, request AOC flight director adjust radar tilt to minimize sea clutter.
- ____ 6. Complete Lead Project Scientist Form.
- ____ 7. Check in occasionaly with the flight director to make sure the mission is going as planned (i.e. turns are made when they are supposed to be made).

Post flight

- ____ 1. Debrief scientific crew.
- ____ 2. Gather completed forms for mission and turn in to data manager at HRD.
- ____ 3. Obtain a copy of the Dropsonde raw and processed files from the AVAPS operator on thumb drive.
- ____ 4. Obtain a copy of the radar LF files from the radar technician on thumb drive.
- ____ 5. Obtain a copy of the tar'ed radar TA files from the radar scientist on thumb drive.
- ____ 6. Obtain a copy of serial flight data and raw NetCDF file on thumb drive from the data technician.
- ____ 7. Obtain a copy of SFMR data on thumb drive from the data technician.
- ____ 8. Obtain a copy of DMT data on thumb drive from the data technician.
- ____ 9. Report landing time, aircraft, crew, and mission status to the Field Program Director.
- ____ 10. Determine next mission status, if any, and brief crews as necessary.
- ____ 11. Prepare written mission summary using **Mission Summary** form.

Lead Project Scientist Check List

Storm or Project Harvey **Experiment name** TDR

Flight ID 170825H1 **Mission ID** ______

A. Participants:

HRD		AOC	
Function	**Participant**	**Function**	**Participant**
Lead Project Scientist	Rogers	Flight Director	Belson
Radar/Workstation	Zhang	Pilots	Price, Rossi, Mitchell
		Navigator	Gallagher
Cloud Physics		Systems Engineer	Mascaro
		Data Technician	Root
Dropwindsonde	Sellwood	Electronics Technician	Richards
AXBT/AXCP	Holbach	Other	
Photographer/Observers/Guests			

B. Take-off and Landing Times and Locations:

Take-Off: 0145 UTC Location: KLAL

Landing: 0845 UTC Location: KLAL

Number of Eye Penetrations: ______

C. Past and Forecast Storm Locations:

Date/Time	Latitude	Longitude	MSLP	Maximum Wind

D. Mission Briefing: Fly TDR mission into Hurr. Harvey, which has undergone RI and is now a 75 kt hurricane. Storm is still experiencing ~10 kt SW shear, but warm waters and mostly moist air in the environment. Good CDO, evidence of eye trying to form on shortwave IR & IR. Convection in eyewall can be seen developing downshear, nothing left of shear, anvil/big upshear, and wrapping around to right of shear. Could be a second stage of intensification over next 12 h, as we enter nighttime + eye clears out possible.

Fly butterfly, IP on N, 75 nm leg lengths for time constraints. Combo GPS/BT at all turn points, outer drop, max wind drop on NE outbound, which aligns w/ CYGNSS.

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E. —Equipment Status (Up ↑, Down ↓, Not Available **N/A**, Not Used **O**)

Equipment	**Pre-Flight**	**In-Flight**	**Post-Flight**	**# DATs / CDs /Expendables/ Printouts**
Radar/LF	✓			
Doppler Radar/TA	✓			
Cloud Physics	✓			
Data System	✓			
GPS sondes	✓			
AXBT/AXCP	✓			
Ozone instrument	—			
Workstation	—			
Cameras	—			

REMARKS:

Lead Project Scientist Event Log

Date 8/24/17 **Flight ID** 170825H1 **LPS** Rogers

Time	Event	Position	Comments
0146	takeoff	KLAL	
0253	obs	ferry, NE Gulf	satellite imagery (SSMI 2023 UTC
			85 PCT) ~~shows~~ from 6
		h ago	shows ring of moderate
		scattering	w/ eyewall; intense scattering
		in outer band	on NE side; suggests potential
		for SEF)	
0343	obs	near IP, NE of	in band on NE side of
		storm	storm. This is where most
			of the weather is. Primarily
		stratiform	precip here, and some
		more isolated,	shallow/moderate convective cores
		FL 50 kt, SF	40 kt here
0349	obs	near IP	deviating around some
		convection on way	to IP, echo tops up to
		14-15 km here;	eye clear on LF, outer
		ring around eye	wall on N side
0400	drop 1, BT	75 nm N ctr	FL 55, SF 40 kt, no BT
0406	obs	50 nm N of eye	in widespread precip,
		some intense	convective cores,
		growing Cu	, ~~some~~ stratiform too
0411	obs	~30 nm N of eye	in outer band feature,
		all strati	form, no local maximum
		in FL or	SF winds
0420	drop 2,	center, 25°27' 94°55'	errop SLP 968,
		peak	FL ~ 105 kt, SF ~ 85 kt
0426	obs	60 nm S of center	going through spiral

band, connects to eyewall in OSR or OSL quads; stratiform precip. in this outer band

Lead Project Scientist Event Log

Date 8/24/17 **Flight ID** 170825H1 **LPS** Rogers

Time	Event	Position	Comments
0434	drop 3, BT	~60 nm S of ge	FL 40, SF 20 kt, turn downwind
			no SST
0443	obs	downwind leg,	looking at FL/SF time
		SE of center	series, see a clear broad
		circulation on	N side, peak eyewall wind
		stronger than	S eyewall. On S side, you
		see winds drop	sharply outside eyewall,
		but also see a	pronounced secondary peak
		in FL (and so	mewhat in SF), likely coincident
		w/ that ~~[illegible]~~	spiral band on S side
0448	drop 4, BT	75 nm SE	FL 40, SF 30 kt,
		~~lost~~	signal to sonde,
		BT	SST 26 (not sure about that)
0454	obs	~40 nm SE center	going through spiral band
		on SE (USR	) side; cellular, shallow
		to moderate	convection, some strat
0459	obs	20 nm from center	LF shows strong echo
		on NW eyewall,	this is same
		feature we	went through on 1st inbound
		leg	
0504	drop 5	25 28' 95 03'	peak FL 80, SF 70 kt on
			SE eyewall, heading
		outbound	to NW
0511	obs	~40 nm NW	in widespread banding features
		here, mos	tly strat w/ isolated
		shallow co	nvection; burst in NW
		eyewall had	echo tops to 18 km

Lead Project Scientist Event Log

Date 8/24/17 **Flight ID** 170825H1 **LPS** Rogers

Time	Event	Position	Comments
0523	drop 6, BT	75 nm NW	FL 50, SF 25 kt,
		BT temps	come in late, ~ 100m down,
		wl temp. of 25 C	
0545	drop 7, BT	75 nm SW	FL 30, SF 20 kt, no BT
0559	obs	~~25~~ N25 nm SW	passed through outer
			spiral band. Mostly
			stratiform. Weak indication
			of FL wind max, not SF through
0604	drop 8, center	25°39' 95°11'	FL 70, SF 60 on SW
0607	drop 9, N eyewall	N eyewall	FL 80 SF 75 kt
	(NESDIS)		
0611	pattern	outbound toward	in center, ~~heading~~ outbound
		NE	deviated to left to avoid
			steep gradients, ~ reflect.
			in NE eyewall. Now having
			to go upwind to get back on track
0619	obs	NE of center	in outer bands on NE,
			mostly stratiform
0637	drop 10, BT	105 nm NE	FL 45-50, sf 30 kt, 30 C
0648	pattern	NE of center	offs tation

Mission Summary

Storm name

YYMMDDA# Aircraft 42RF

Scientific Crew (42RF)

Lead Project Scientist: Rogers

Radar Scientist: Zhang

Cloud Physics Scientist: —

Dropwindsonde Scientist: Sellwood

Boundary-Layer Scientist: Holbach

Workstation Scientist: —

Observers (affiliation): —

Mission Briefing: (include sketch of proposed flight track or page #)

See previous

Mission Synopsis: (include plot of actual flight track) Flew pattern as planned. Harvey continued to strengthen some, but not rapidly, during flight. Satellite & radar presentation showed pronounced banding features. Open eyewall to SE & S, likely due to SW shear impinging on system. Band showed complex structure, w/ evidence of wind maxima on S side, but not as much on N. Band connected to inner eyewall on N side (DSL). Sampled convection in eyewall first on N side inbound, then again on NW side outbound ~1.5 h later. Thinking that was same feature, so may have gotten multiple looks at same feature as it moved around storm. Truncated leg on S side for time savings, abbreviated orca ship refueling gradient on final NE pass. Extended leg to NE for Cygnss coordination, dropping NESDIS sonde there.

This could be a good dataset to examine the structural variability of a spiral rain band that could potentially transition to a secondary eyewall in the next 12 h.

Evaluation: (did the experiment meet the proposed objectives?)

Mission did meet objectives. Radar worked fine; 3 analyses produced and transmitted; sondes mostly worked (1 failure); most BT's did not work. SFMR worked.

Problems: (list all problems)

4 of 6 BT's did not work; 1 produced suspect SST.

Expendables used in mission:

GPS sondes : 10 (6 HFIP, 3 NHC, 1 NESDIS)

AXBTs : 6

Sonobuoys: —