

Preparing Coherent Doppler Lidars for the DC-8 and WB-57

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DC-8 vs. WB-57

	DC-8	WB-57
Nadir Port	Yes	Yes
Payload	30 Klb/14 Mg	4 Klb/1.8 Mg
Service Ceiling	42 K ft/13 km	60 K ft/18 km
Duration	12 hr	6.5 hr
Pressurized	Yes	Choice
Experimenters on Board	Yes	No
Cruise Speed	250 m/s	210 m/s
Cost	\$5K/hr	\$2.5K/hr



Development of Lidar Subsystems

	VALIDAR	LRRP	DAWN	DAWN-AIR1 DC-8	DAWN-AIR2 WB-57
Transceiver	Breadboard	Compact 1	Compact 2	Compact 2 or 3	Compact 2 or 3 or 4
Laser Control Electronics	Breadboard	Compact 1		Compact 2	Compact 3 Autonomous
Telescope	Medium Energy		High Energy 1	High Energy 2	High Energy 3 (SPARCLE)
Scanner	Trailer, Full Hemispheric			Wedge 1 (SPARCLE)	Wedge 1 (SPARCLE)
Data Acquisition	Breadboard, Ground-Based			Compact, High Velocity 1	Compact, High Velocity 1 Autonomous



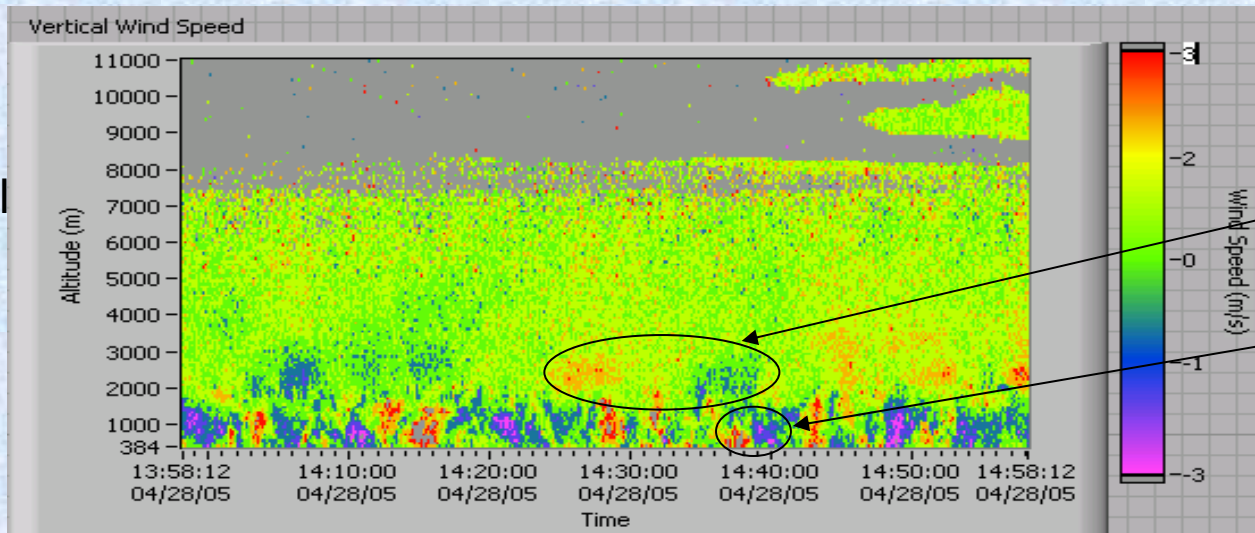
Development of Lidar Subsystems

	VALIDAR	LRRP	DAWN	DAWN-AIR1 DC-8	DAWN-AIR2 WB-57
Pulse Energy	90 mJ		250	250	250
PRF	5 Hz		10	10	10
Diameter	10 cm		10	15	25
Geometry	Looking Up		Looking Up	Looking Down	Looking Down
Lidar Sensitivity “Gain”	1		X 4	X 9	X 24



VALIDAR: 1 Hour of Vertical Data

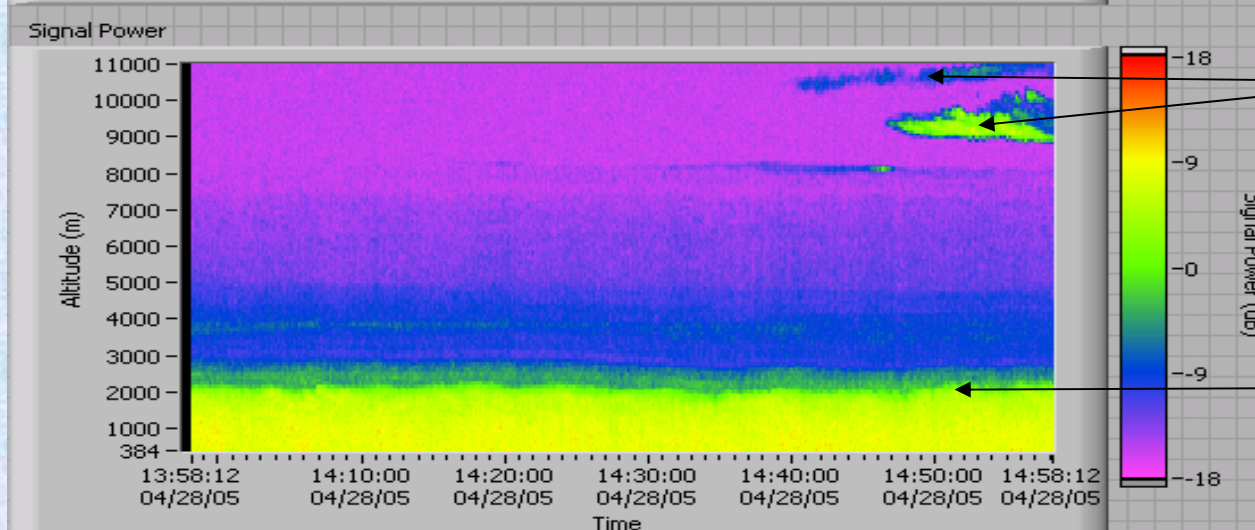
Vertical
Wind
Speed



buoyancy wave

horizontal
convective
roll

Signal
Power



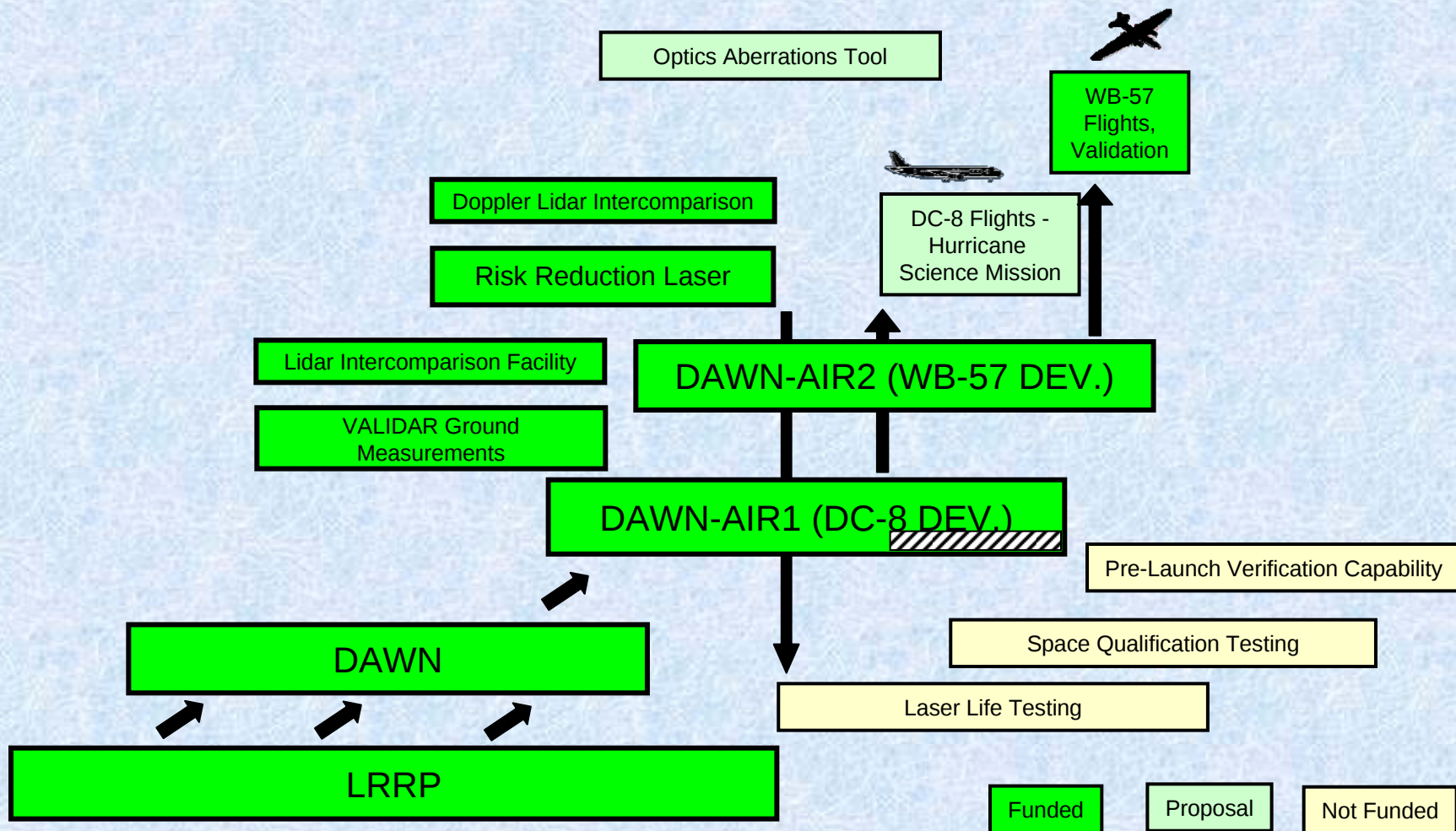
cirrus clouds

top of atmospheric
boundary layer



Coherent Wind Lidar Activities at LaRC

FY06				07				08				09				10				11				12				13			
Sep	Jan	Apr	Jul																												





BACKUP



Potential 3-D Winds Mission Schedule

