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RADARSAT SYSTEMS: SATELLITE CHARACTERISTICS

To gain more insight into the capabilities and technical aspects of the Canadian Earth Observation satellites RADARSAT-1, RADARSAT-2 and RADARSAT Constellation, below you will find an illustration and a table comparing their features in terms of system characteristics and beam modes.

		RADARSAT-1	RADARSAT-2	RADARSAT Constellation
GENERAL	High Resolution	8 m X 8 m (stripmap mode)	1 m X 3 m (spotlight mode)	1 m X 3 m (spotlight mode)
	Total mass at launch	2,750 kg	2,200 kg	1,300 kg
	Mission life	5 years	7 years	7 years (each satellite)
	SAR antenna dimensions	15 m x 1.5 m	15 m x 1.5 m	6.75 m x 1.38 m
	Solar arrays (each)	2.21 m x 1.32 m	3.73 m x 1.8 m	2.2 m x 1.7 m main power (one panel vs two for RS1 and 2) 0.5 m x 1.6 m (keep-alive power)
	Bus	3.55 m x 2.46 m	3.7 m x 1.36 m	Canadian SmallSat Bus
	Look Direction	Right looking	Routine left- and right-looking operation Increased re-visit time for improved monitoring efficiencies	Right looking Multiple satellites will eliminate need for left and right looking to increase revisit
RADAR	Active Antenna	C-band	C-band	C-band
	Centre Frequency	5.3 GHz	5.405 GHz	5.405 GHz
	Bandwidth	30 MHz	100 MHz	100 MHz
	Polarization	HH	HH, VV, HV, VH	HH, VV, HV, VH, Compact Polarimetry
	Polarization Isolation	> 20 dB	> 25 dB	>28 dB as of latest specs >30 dB pending change request
	Aperture Length	15 m	15 m	6.75 m
	Aperture width	1.5 m	1.37 m	1.38 m
	Mass	679 kg	750 kg	400 kg approximate
	Deployment Mechanism	Extendable support structure (ESS)	Extendable support structure (ESS)	Simple strut deployment with a kinematically decoupled internal support structure
ORBIT	Altitude	793-821 km	798 km	592.7 km
	Inclination	98.6 degrees	98.6 degrees	97.74 degrees
	Duration of one orbit	100.7 min	100.7 min	96.4 min
	Descending node	6:00 hrs	6:00 hrs	6:00 hrs +/- 15 min
	Ascending node	18:00 hrs	18:00 hrs	18:00 hrs
	Sun-synchronous	14 orbits per day	14 orbits per day	14.92 per day

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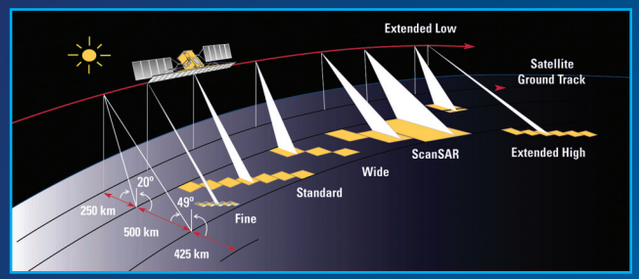
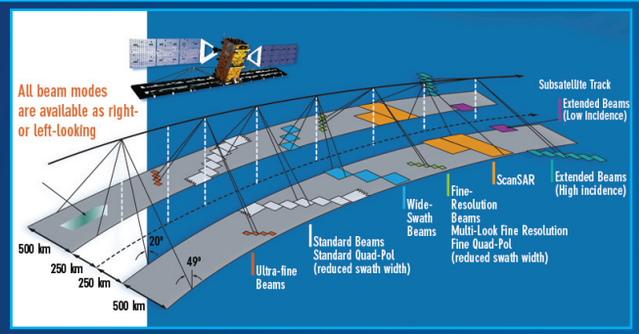
BEAM MODES

RADARSAT-1



Beam Modes	Nominal Swath Width (km)	Nominal Resolution (m)
Fine	45	8
Standard	100	30
Wide	150	30
Scansar narrow	300	50
Scansar wide	500	100
Extended high incidence	75	18-27
Extended low incidence	170	30

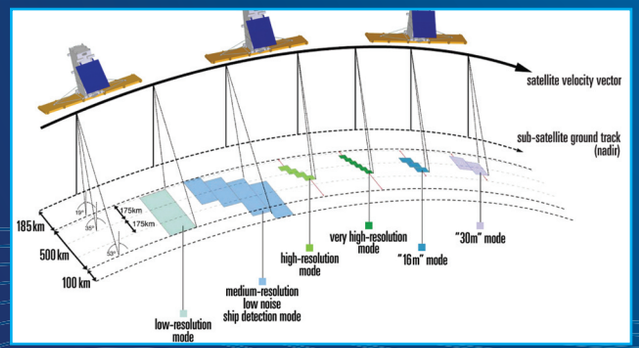
RADARSAT-2



Beam Modes		Nominal Swath Width (km)	Approximate Resolution (m) *1
Selective Polarization Transmit H or V receive H and/or V	Fine	50	10 x 9
	Standard	100	25 x 28
	Low incidence	170	40 x 28
	High incidence	75	20 x 28
	Wide	150	25 x 28
	ScanSAR narrow	300	50 x 50
	ScanSAR wide	500	100 x 100
Polarimetric Transmit H and V on alternate pulses / receive H and V on any pulse	Fine Quad-pol	25	11 x 9
	Standard Quad-pol	25	25 x 28
Selective Single Polarization Transmit H or V receive H or V	Ultra-Fine	20	3 x 3
	Spotlight	18	3 x 1
	Multi-Look Fine	50	11 x 9

*1. Ground range by azimuth

RADARSAT Constellation



Beam Modes	Nominal Swath Width (km)	Approximate Resolution (m)
Low Resolution	500	100 x 100
Medium Resolution (Maritime)	350	50 x 50
Medium Resolution (Land)	30	16 x 16
Medium Resolution (Land)	125	30 x 30
High Resolution	30	5 x 5
Very High Resolution	20	3 x 3
Ice/Oil Low Noise	350	100 x 100
25 m ship mode	350	Variable
Spotlight mode	5	1 x 3

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