LIST OF FIGURES

Figure

Title

1.1	(<i>a</i>) solid line indicates the phase velocity and dashed line represents group velocity of tsunami waves in ocean for various depths of 1,2,4, and 6 km depth, (<i>b</i>) shows the variation of wavelength with wave period, tsunami windows appeared [Dean, 1980]	9
1.2	Tsunami Shoaling from deep to coastal region	10
1.3	Tsunami Eigen functions in a 4 km deep ocean at periods 1500, 150 and 50s. Vertical displacements at the ocean surface have been normalized to 1 m in each case	11
1.4	(<i>a</i>) Side looking SAR geometry and flight path, (<i>b</i>) SAR image consists of the hard targets (brighter pixels due to high backscattered response) and ocean background (dark pixels due to low backscattering response)	14
1.5	Synthetic aperture lengths (<i>a</i>), concept of array of real antenna positions forming a synthetic aperture (<i>b</i>).SAR beam interaction with target	14
1.6	Along track geometry of a SAR system	15
2.1	Acquired datasets for the tsunami detection and arrival monitoring.	27
2.2	Decision for monitoring using BPR measurement	28
2.3	Decision tree for confirmation, cancellation and update the database	29
3.1	Flow chart for the measurement of Tsunami wave parameters	36
3.2	Wave representations in Ocean	37
3.3	Variation of earthquake parameters such as fault length (l in Km), width (W in Km), area (A in Km^2) and displacement (D in cm) with respect to earthquake magnitude (M)	41
3.4	Result for water wave angular frequencies in deep, intermediate and shallow waters with respect to (<i>a</i>) wave length, and (<i>b</i>) wave number	44
3.5	Measurement of orbital velocities (horizontal (u_x) , vertical (u_z) and resultant (u_r)) in deep water (thick line) and its validation with standard model (dotted line)	47
3.6	Measurement of orbital velocities (horizontal (u_x) , vertical (u_z) and resultant (u_r)) in intermediate water (thick line) and its validation	48

3.7	with standard model (dotted line) Measurement of orbital velocities (horizontal (u_x) , vertical (u_z) and resultant (u_r)) in shallow water (thick line) and its validation with	
	standard model (dotted line)	49
3.8	Result for orbital accelerations (horizontal (a_x) , vertical (a_z) and resultant (a_r)) in deep water (thick line) and its validation with standard model (dotted line)	52
3.9	Result for orbital accelerations (horizontal (a_x) , vertical (a_z) and resultant (a_r)) in intermediate water (thick line) and its validation with standard model (dotted line)	53
3.10	Result for orbital accelerations (horizontal (a_x) , vertical (a_z) and resultant (a_r)) in shallow water (thick line) and its validation with standard model (dotted line)	54
3.11	Calculated result for wave potentials (thick line) in deep, intermediate and shallow waters along with the validation with standard model (dotted line)	57
3.12	Simulated result for celerity measurements in all three water wave conditions for 80 <i>Kms</i> from the origin of tsunami center	58
4.1	Schematic diagram for the different modes obtained by RADARSAT-2 sensor	61
4.2	Illustration showing the Bragg scattering phenomena	63
4.3	(<i>a</i>) The universal site of the Japan earthquake and the radars in Hokkaido and on the Kii Strait. (<i>b</i>) The bathymetry offshore Kameda Peninsula, (<i>c</i>) Circular current speeds from the, Hokkaido radar.	66
4.4	Flow chart for the tsunami detection factor (<i>q</i> -factor) measurement using radar remote sensing technique	67
4.5	Time series of velocity components from radar A088. (a) Blue: 0– 2 km; Red: 2–4 km; Black: 4–6 km over 5 h (<i>b</i>) <i>q</i> -factor for 0–6 km offshore (<i>c</i>) Blue: 6–8 km; Red: 8–10 km; Black: 10–12 km (<i>d</i>) <i>q</i> -factor for 6–12 km	
	offshore	69