



Storms from Space

S. Lehner

German Aerospace Center, IMF, Oberpfaffenhofen D 82234 Wessling (Susanne.Lehner@dlr.de)

Not many direct observations of storm surges from space are available. Spaceborne Sensors will yield valuable observations though on the weather situation in which storm surges occur providing two dimensional coverage over large areas. This input maybe crucial to improve the modelling of storm surges. Optical Imagery obviously allows to observe the cloud coverage and structure. The wind field can be derived from Scatterometer and Synthetic Aperture Radar data to an accuracy of about 2 m/sec up to 40 m/sec, which may not be sufficient for extreme hurricane cases. In high wind speed or strong rain special algorithms have to be used to investigate the maximum wind speeds, e.g., of tropical cyclones. For several tropical cyclones wind speed is derived together with sea state from SAR data. Significant wave height up to 15 meters is derived from altimeters, the full two dimensional ocean wave spectrum as well as information on individual ocean waves can be deduced from Synthetic Aperture Radar Data. TerraSAR-X is a high resolution radar satellite, that can be used additionally to measure the change in water and coast lines at a spatial resolution of less than one meter. Several Storms, e.g., Britta occurring on November 1st 2006 over the North Sea and Kyrill that caused surges and severe coastal damages are analysed as well as tropical cyclones. Global maps of sea state and a statistical analysis for significant wave height is given. The La Reunion case in which high swell caused severe flooding and damage of the island is shown. Several accidents of ships in severe weather are analysed. An outlook on the use of high resolution data as well for derivation of meteo-marine parameters as the determination of morphology is given.