Wave Forecasting Using a Spectral Wave Model During Northeast Monsoon

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A Spectral wave model on unstructured meshes is used for simulate and forecast Wave parameters for Indian Ocean region including coastal areas. This model simulates the growth, decay and transformation of wind generated waves and swells in offshore and costal areas. Coarse resolution is used for the general part of the mesh and depth adaptive mesh used to describe the shallow water environment at the coast line. The region chosen for the study is from 60°S to 30°N and from 30°E to 120°E. The resolution of the bathymetry varies inside the domain with coarse resolution in the open ocean and finer resolution in the shallow water areas. The model is forced with European Centre for Medium Weather Forecast wind data. Period of study is from November to March. This Spectral Wave model is customized for this region and tuned for the season.

The results Validated with available buoy data **DS4 (off paradweep), DS5 (off vizag) and Pondicherry coast.** The Validation is done for forecast up to the sixth day. RMS error and bias were below the values 0.30 and 0.23 up to three days and increased up to 0.45 and 0.28 after three days in the open ocean buoys.RMS error and bias were below the values 0.20 and 0.22 up to three days and increased up to 0.35 and 0.25 after three days in the shallow water buoys. The scatter index is less than 25% up to four days and increased up to 30% after four days in the open ocean buoys and it is less than 20% up to four days and increased up to 30% after four days in the shallow water buoys. For any operational forecast agency error in wave height up to 30% is considered to be good. High correlation is observed between forecast and observed wave height data.

Key words: Wave forecast, Monsoon, wave rider buoys, Validation