Tropical cyclones are one of the extreme weather events among all natural disasters. They are abundant over warm tropical waters with specific domains of frequent occurrences. These storms possess characteristic vortex structure, concentric wind and rain fields surrounding a relatively calm Eye region. Several meteorological organizations around the world are involved in studying cyclonic storms during corresponding active seasons over western north Pacific, eastern north Pacific, north Atlantic and north Indian Ocean. The major objective of monitoring these storms is to forecast their track and intensity during landfall. Satellite and Radar images along with surface and buoy meteorological observations and weather models serve a great purpose today in this field of research. Theoretical studies have led to formation of the genesis criteria of tropical cyclones. Still most of the studies are carried over Pacific and Atlantic Ocean. Indian regime parented most deadly storms ever occurred on earth surface but the number of investigations over Indian ocean are less frequent. In recent years storm tracking and intensity forecasting has been improved. Studies in climatological and instantaneous scale are necessary to identify seasonal trends, morphological features and thermodynamic behavior of atmosphere on local scale.

Tropical cyclones exert their devastative aftermath through their high wind gust, torrential rainfall and storm surge events. Almost each year Indian coastline experiences misery due to landfall
events of these storms. Changing trends of global sea surface and atmospheric temperature along with moisture recycling rate have the potential to alter entire tropical cyclone climatology. Thus contemporary studies are the need of the hour. Many area still remain unexploited for cyclone research viz Climatological trends of tropical cyclones over the Bay of Bengal, electrification (IFIA) during cyclonic days at VLF band, morphological structure of storms and response of atmospheric boundary layer, prediction tool for forecasting damages etc.

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The predictability of storms in terms of their emergence and pathways to destiny is a voyage towards the sight of God. But if the trial is contained in a pilgrim heart then this journey is worthy of a life time. This dissertation is a part of that journey for myself.

Place:

Date:               Signature