

Another Look at Maximum Potential Intensity Estimates for Tropical Cyclones

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There have been several theoretical studies on the Maximum Potential Intensity (MPI) of tropical cyclones (TC). MPI is thought to be a function of sea surface temperature and the thermodynamic profile of the atmosphere and represents an upper bound to intensity estimates, making it an important quantity to know when diagnosing and predicting TC intensity. Empirical versions of MPI have been derived for use in statistical TC intensity models (e.g., Statistical Hurricane Intensity Prediction Scheme, or SHIPS).

This study has two main objectives. First, a longer dataset (1982-2010) of reanalysis fields and sea surface temperatures will be used to derive updated empirical formula for MPI. Although this updated empirical MPI formula should be more robust than the previous version, it is likely that errors will still occur in certain circumstances (e.g., marginal SSTs). As such, the second objective of this project is to combine the updated empirical formula with theoretical MPI calculations and satellite altimetry-derived ocean heat content data to create a new hybrid MPI for use in the SHIPS scheme for the N. Atlantic and N.E. Pacific basins.