# Performance of a Modified LKB-Based Evaporation Duct Model for Stable and Subrefractive Environments

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A modified version of the Liu-Katsaros-Businger (LKB) model (J. Atmos. Sci., 1979) for the calculation of evaporation duct refractivity profiles developed by the Naval Postgraduate School (NPS) was recently presented (Frederickson, NRSM, 2012), and its performance evaluated in stable environments (Newkirk, *et al.*, NRSM 2013). This model replaced the Beljaars and Holtslag similarity functions (J. Appl. Meteorol., 1991) with those developed by Grachev, et al. (Boundary-Layer Meteorol., 2007), yielding a new variant of a model that computes more reasonable evaporation duct refractivity profiles for cases where the marine layer is strongly stable, as indicated by a strongly positive air-sea temperature difference (ASTD).

In this effort, we build on the recent validation work to present the results of several comparisons between the previous and new evaporation duct models for a variety of stable and subrefractive cases observed during a 2010 test in the region around Wallops Island, VA. The model-generated refractive profiles for these cases are used in the Tropospheric Electromagnetic Parabolic Equation Routine (TEMPER) propagation model developed by the Johns Hopkins University / Applied Physics Laboratory (JHU/APL) to provide a quantity called the propagation factor. These results are compared to propagation factor values derived from C-band propagation link measurements in the Wallops Island area during the times of the stable and subrefractive cases, in order to assess the performance of the signal level predictions based on this implementation of the LKB model.