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Statistical scale invariance in satellite observations of water vapor mixing ratio from the Atmospheric Infrared Sounder KYLE PRESSEL, The University of California, Berkeley, WILLIAM COLLINS, Lawrence Berkeley National Laboratory — Statistical scale invariance appears almost ubiquitously in fluid dynamical systems and often characterizes universal aspects of particular classes of flows. Perhaps the most famous instances of statistical scale-invariance in the atmospheric sciences are the Kolmogorov's -5/3 and Charney's -3 variance spectra for passive scalars and velocity in 3D and quasi-geostrophic turbulence respectively. Parameterizations of radiative transfer and clouds in global climate models (GCMs) depend on proper characterization of the spatial statistics of water vapor, which is not a passive scalar. Empirical investigations of the scale dependence of water vapor statistics have largely depended on aircraft observations, which are limited in spatial and temporal extent. We will present results from a structure function analysis of statistical scale invariance of water vapor mixing ratio fields as observed by the Atmospheric Infrared Sounder (AIRS) onboard NASA's Aqua satellite and discuss the application of these results to the GCM parameterization problem.

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