

**Interannual variations of ice water content over the tropical Pacific basin: satellite observations, reanalysis, and GCM comparisons**Huiwen Chuang<sup>†</sup>; Xianglei Huang; Hui Su; Jonathan Jiang<sup>†</sup> University of Michigan, USALeading author: [huiwen@umich.edu](mailto:huiwen@umich.edu)

We examine the interannual anomalies of ice water content (IWC) and ice water path (IWP) over the tropical Pacific basin as observed by Aura microwave limb sounder (MLS), assimilated by the recent ECMWF interim reanalysis, and simulated by four GCMs for IPCC the fourth assessment. Though it has been well aware that the GCM-simulated mean state of IWC (IWP) is largely different from each other and model-observation discrepancies are also prominent, two interesting findings from composite analysis here are that (1) observed and modeled IWC (IWP) interannual anomalies all show a good linear relation with corresponding anomalies of 500hPa vertical velocity ( $\omega_{500}$ ); (2) MLS, ECMWF reanalysis, and GCMs have much better agreement in terms of the fractional change of IWC (IWP) anomalies with respect to  $\omega_{500}$  than in the climatology of IWC (IWP). We further separate the Pacific basin into two regimes based on the correlation coefficients between  $\omega_{500}$  anomalies and upper tropospheric temperature anomalies. ECMWF interim reanalysis and all GCMs show noticeable differences in the fractional changes of IWC anomalies with  $\omega_{500}$  anomalies over the two regimes. But results from MLS data show little difference between the two regimes. This study highlights the close relation between dynamic field and ice cloud concentration at the interannual timescale.