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Supporting Information for

Sensitivity of Simulated Deep Convection to a Stochastic Ice Microphysics Framework

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Introduction

Figures S1 and S2 provide information discussed in Section 5.2.1 of the main manuscript regarding the impact of the *b* parameter on anvil cirrus cloud properties. These figures are included here so as not to distract the reader from the main points in the manuscript but also allowing the interested reader to analyze these properties in more depth and to simply provide evidence for the arguments made in the manuscript.

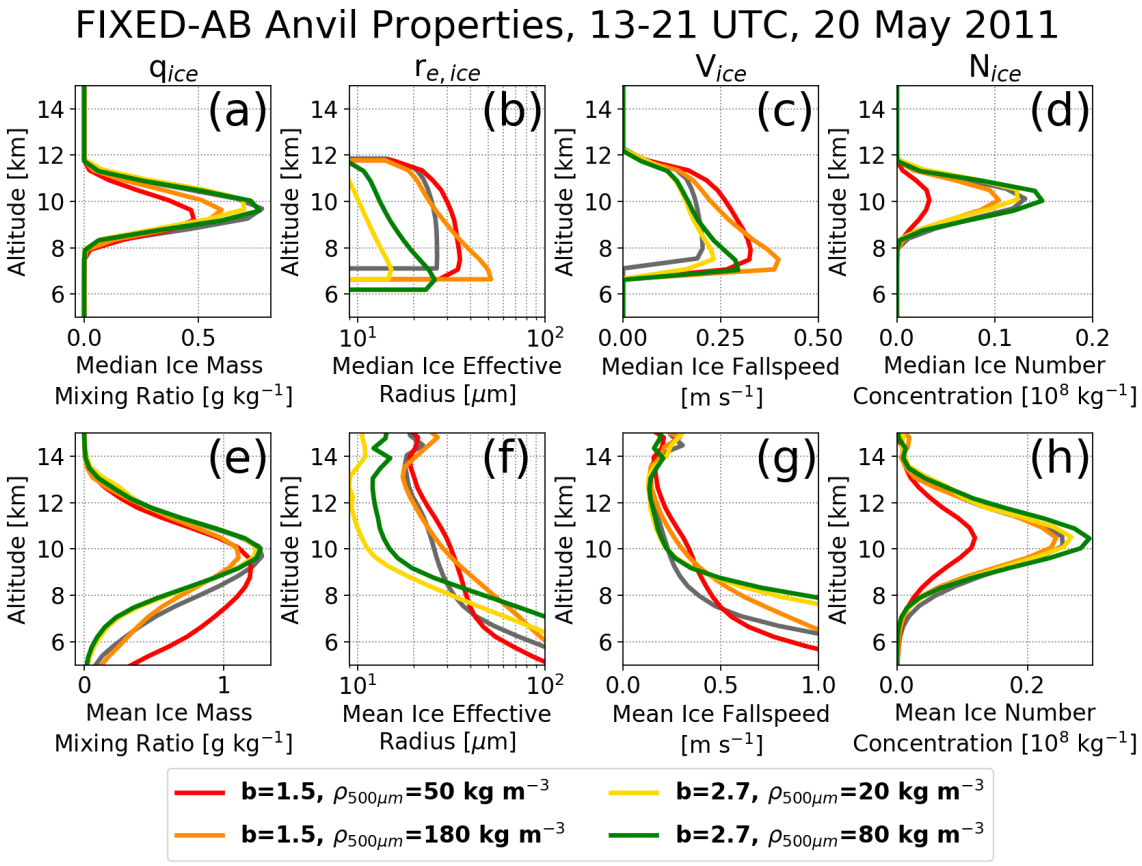

Figure S1. Profiles of (a) median and (e) mean ice mass mixing ratio, (b) median and (f) mean ice effective radius, (c) median and (g) mean mass-weighted ice fallspeed, and (d) median and (h) mean ice number concentration mixing ratio for all grid points identified as anvil during the 1300-2100 UTC time period of the FIXED-AB 20 May 2011 simulations.

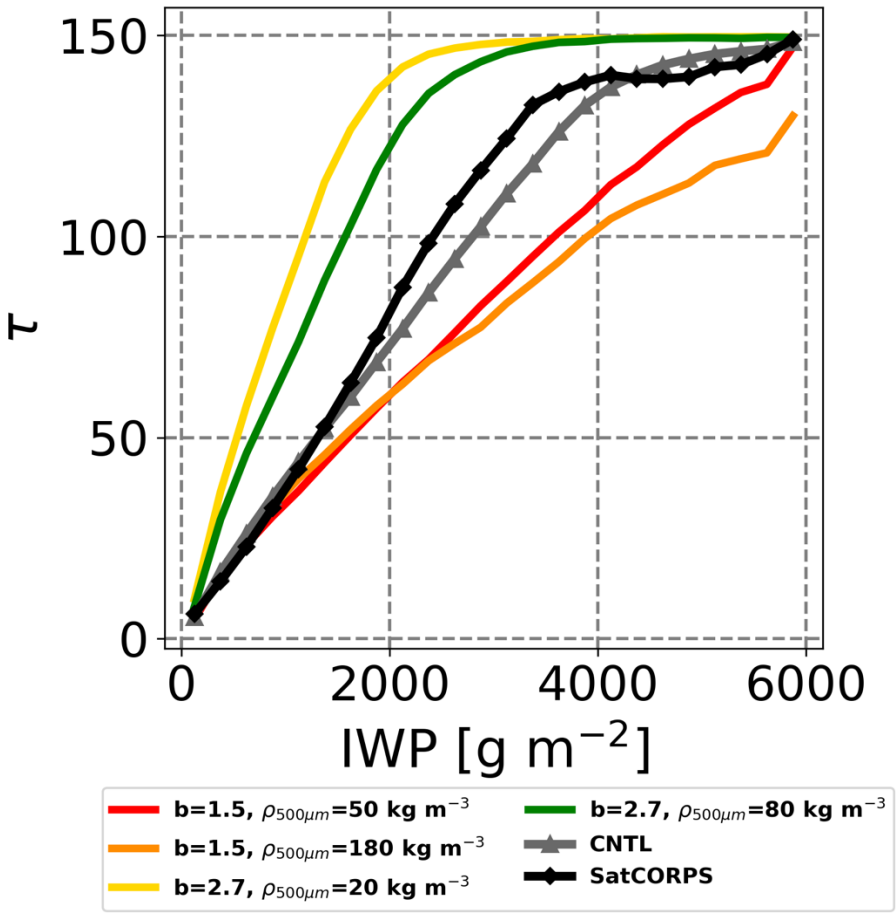

Figure S2. Average optical depth ($\boldsymbol{\tau}$) as a function of ice water path (IWP) bins for the FIXED-AB ensemble members during the 1300-2100 UTC time period of the 20 May 2011 event. The CNTL member is shown in grey with triangles and the SatCORPS observed relationship is shown in black with diamonds.