Supporting Information for

The impact of Secondary Ice Production on Arctic Stratocumulus

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Follwing a brief introduction, this document includes three Figures which are referred in the main text, however they are not essential for the main conclusions of this study.

Introduction

The text in this Supporting information provides additional information necessary to the credibility of the LPM set-up used in the main text. In the main text, an LES and a LPM are combined to study the influence of three SIP mechanisms (rime-splintering, collisional break-up and droplet-shattering on Arctic stratocumulus clouds. The main result is that rime-splintering has a very weak impact, while collisional break-up appears to be the most critical mechanism. Droplet-shattering remain ineffective in cold Arctic

Figures:

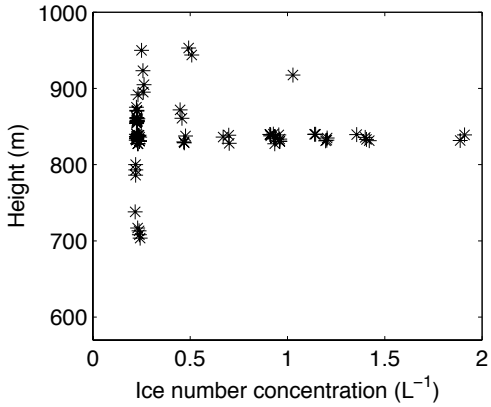

Figure S1: Number concentration for ice crystals with diameter ~ 400 μm or larger, measured within the cloud layer.

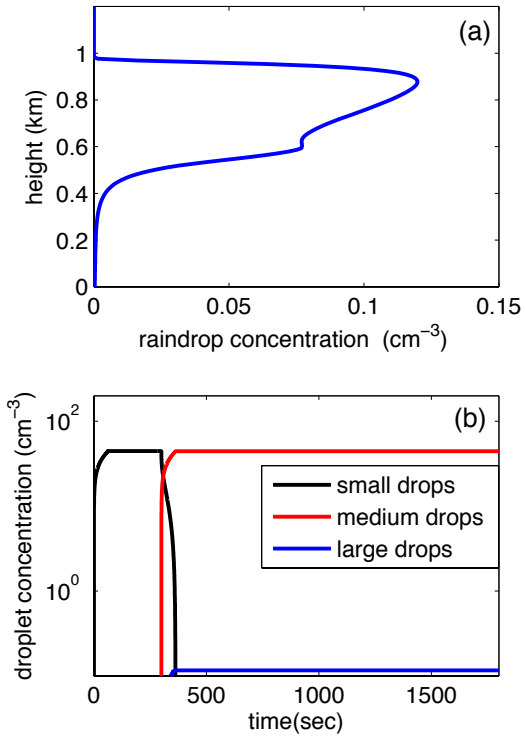

Figure S2: (a) Vertical profile of rain droplet concentration after 2.5 hours of simulation time (when maximum precipitation is observed) for the LES CNTRL simulation. (b) Timeseries of droplet concentrations for the three bins of the LPM. This LPM simulation corresponds to the mean thermodynamic conditions of the ACCACIA case: T_{cbh} = -3.5^{o}C and W = 0.25 m s^{-1}.

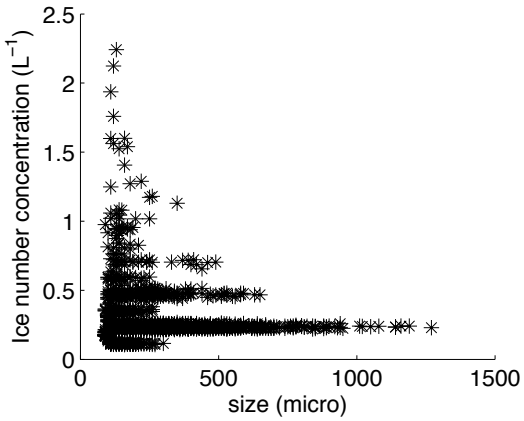

Figure S3: Ice number concentrations (L^{-1}) as a function of size (μm), measured within the cloud layer.