

Height intervals (km)

(a) Shallow cumulus

(b) WCB ascent

(c) WCB cyclonic outflow

(d) WCB anticyclonic outflow

3D effects

Cloud horizontal heterogeneity,  
without overlap assumption

Cloud horizontal heterogeneity,  
with overlap assumption

Ice-optical parameterization

Net CRH uncertainty ( $\text{K day}^{-1}$ )

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Net CRH uncertainty ( $\text{K day}^{-1}$ )

10-12

8-10

6-8

4-6

2-4

0-2

0.0 1.3 2.6 3.9 5.2 6.5

0.0 0.7 1.4 2.1 2.8 3.5

0.0 0.5 1.0 1.5 2.0 2.5

0.0 0.4 0.8 1.2 1.6 2.0