



**Scenario: Future**

**CKD model: RRTMGP-NN**

Bias TOA upwelling:  $-0.45 \text{ W m}^{-2}$

Bias surface downwelling:  $0.54 \text{ W m}^{-2}$

RMSE TOA upwelling:  $0.60 \text{ W m}^{-2}$

RMSE surface downwelling:  $0.83 \text{ W m}^{-2}$

RMSE heating rate (0.02-4 hPa):  $0.447 \text{ K d}^{-1}$

RMSE heating rate (4-1100 hPa):  $0.116 \text{ K d}^{-1}$