

# The effect of a well-resolved stratosphere on East Asian winter climate

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This study performs a comparison between models with and without well-resolved stratosphere on the simulation of the East Asian winter climate. The results reveal that the CMIP5 (Fifth Coupled Model Inter-comparison Project) models with model top above the stratopause have a better simulation of the distribution of surface air temperature, sea level pressure and precipitation than the models with a low-top below the stratopause. The discrepancy of the East Asian winter climate between high-top (HT) and low-top (LT) CMIP5 models is also evident in the future projection under higher (RCP85) and midrange (RCP45) emission scenarios. The high-top models present about 1.3°C and 1.7°C higher surface air temperature in East Asian region under RCP45 and RCP 85 scenarios by the end of this century than that of the low-top models. Therefore, the insufficient representation of the stratosphere may lead to underestimation of the anthropogenic global warming in regional scale and hence have the potential to lead to insufficient response action and mitigation measures.

Key words: Stratosphere, CMIP5, East Asia winter monsoon

## References

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