



Global warming enhances the mid-latitude meridional heat imbalance within the atmosphere

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The heat imbalance is the original driver for the circulations within the Earth system. Therefore, it is critical important to understand how it respond to global warming. Here, we present both observational and model evidences indicating strengthening meridional heat imbalance over the mid-latitude. This is primarily because the uneven ocean heat uptake between the subtropical and subpolar ocean, since the subtropical ocean is well stratified, while the subpolar ocean is dominant by upwelling, strong mixing and overturning circulation. We propose that the enhanced heat imbalance has potentially significant contribution to the strengthening water cycle, westerlies and storms under global warming.