

Different Asian monsoon rainfall responses to idealised orography sensitivity experiments in the HadGEM3-GA6 and FGOALS-FAMIL global climate models

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Recent work has shown the dominance of the Himalayas in supporting the Indian summer monsoon (ISM), perhaps by surface sensible heating along its southern slope and by mechanical blocking acting to separate moist tropical flow from drier mid-latitude air. Previous studies have also shown that Indian summer rainfall is largely unaffected in sensitivity experiments that remove only the Tibetan Plateau. However, given the large biases in simulating the monsoon in CMIP5 models, such results may be model dependent. This study investigates the impact of orographic forcing from the Tibetan Plateau, Himalayas and Iranian Plateau on the ISM and East Asian summer monsoons (EASM) in the UK Met Office HadGEM3-GA6 and China's Institute of Atmospheric Physics FGOALS-FAMIL GCMs. The models chosen feature opposite-signed biases in their simulation of the ISM rainfall and circulation climatology.