



On semi-empirical attribution of multidecadal climate variability

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We combine CMIP5 historical simulations and observations of sea-surface temperature (SST) and sea-level pressure (SLP) to investigate relative contributions of forced and intrinsic climate variability to long-term (decadal +) climate trends. Climate models are overly sensitive to forcing, so that the models' historical simulations have to be scaled back to match the observed trends. On the other hand, the simulated intrinsic variability is much weaker than observed, especially in the SLP. There are also substantial differences in the spatiotemporal structure between the observed and simulated intrinsic variability. These discrepancies suggest that a contribution of multidecadal intrinsic climate variability to the observed climate change is distorted in the CMIP5 simulations; hence, our ability to attribute and predict climate change using these models is limited.