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Sensitivity of detection and attribution of climate change to simulated climate variability

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The statement in the IPCC 4th Assessment that most of the observed global warming since the mid-20th-century is "very likely" due to the anthropogenic increase in greenhouse gas depends heavily on the statistical method of optimal fingerprinting and on its estimates of internal climate variability. In particular, the estimation of internally generated variability plays a central role in defining the "goodness-of-fit" between models and observations in both detection and attribution of external influences on climate and in the evaluation of climate models. However, most climate models remain deficient at representing important aspects of interannual and longer time-scale variability. We ask what is the sensitivity of attribution statements to a potential misrepresentation of internally-generated variability by climate models and we aim to use the CMIP-5 ensemble to update this statement, accounting for a broader range of consistent model simulations and assessing the impact of the decade of near-stable temperatures post 2000.