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NO IMPACT OF ANTHROPOGENIC AEROSOLS ON EARLY 21ST CENTURY GLOBAL TEMPERATURE TRENDS IN A LARGE INITIAL-CONDITION ENSEMBLE

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Résumé:

Anthropogenic-aerosol radiative forcing (AA) modulates multidecadal greenhouse radiative forcing. However, decadal climate responses to AA are poorly characterized given AA forcing uncertainty and internal climate variability. This motivates revisiting a recent claim that AA drove a negative trend in the Pacific Decadal Oscillation (PDO) and an associated cooling influence in the 10-15 years following the late-1990's El Niño. The average of a 50-member initial condition ensemble of the second generation Canadian Earth System Model CanESM2 that was forced only with AA does not exhibit the negative-PDO/slowdown response. However, spurious responses of this kind, that are artifacts of subsetting the larger ensemble in a manner consistent with published literature, can readily be found. This illustrates the caution needed in interpreting regional- and decadal-scale responses to AA, and suggests that improved characterization of model uncertainty in AA over the recent period is required.