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## The Asian-Australian Monsoon: Contributions of external forcing to the summer's cooling trend over East Asia

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Observations indicate that East Asia summer was cooling at surface under the background of global warming during past decades. In this study, we examine the cooling trend with the station data from 1950 extending to recent year firstly, and then we address two scientific questions through a series of numerical experiments based on the SAMIL AGCM: (a) whether external forcings contributed to the cooling trend over East Asia; (2) which external forcing is dominant. We carried out a suite of numerical experiments to investigate the effects of four kinds of external forcings, including green house gases (GHGs), solar constant, ozone and direct effects of aerosols. The results indicate that external forcing contributes significantly to the cooling trend over East Asia during past decades. Furthermore, GHGs and direct effects of aerosols are considered to be the two main contributors to the cooling trend and the effect of the former is stronger. The possible linkages between the external forcing and the cooling trend are also discussed. Keywords: East Asia, summer cooling trend, external forcing, SAMIL