



## **Emerging aerosol forcing patterns over Asia**

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Aerosol emissions within southern and eastern Asia are rapidly changing, in composition and source regions. The resulting pattern of climate forcing may induce impacts that affect millions of people over the coming decades, in a region where current models perform poorly and predictions are consequently not trustworthy. We argue that there is an urgent need for increased attention to the climate impacts of trends in Chinese and Indian aerosol emissions, and illustrate this through the possible emergence of a striking dipole pattern of Asian aerosol concentrations and radiative forcing.

In this talk, we first outline the possible evolutions of emissions of black carbon (BC) and SO<sub>2</sub> (sulfate precursor) emissions from India and China, based on the Shared Socioeconomic Pathways (SSPs). Using a chemical transport model (OsloCTM3) and radiative kernels, we estimate future seasonal patterns of aerosol loading and radiative forcing over the Asia region. Under reasonable assumptions on near term trends, we identify a dipole pattern in forcing that is likely to affect regional weather patterns and extreme precipitation rates, possibly lasting for 1-2 decades. We then discuss the potential dynamical responses to this and other regional forcing patterns, using new, high temporal resolution simulations from a recent Earth System Model (CESM1).