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Aerosol-cloud interactions over major urban clusters of China using MODIS satellite data

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Urban clusters are a prominent political and economic issue in China. Increased numbers of cities of different sizes and intensive urbanization characterize these regions, which extend over hundreds of kilometers. We study here the interactions between aerosols and clouds under different synoptic regimes over major urban clusters of China, using a decade (2003 - 2013) of MODIS observations from Terra and Aqua satellites. The relationships which are studied are mainly between the aerosol optical depth at 550 nm (AOD550) and cloud cover (CC), cloud water path (CWP) and water vapour (WV). The region of China was separated in 5 climatic zones which are primarily influenced by the Asian monsoon systems and the Tibetan Plateau. Over all urban clusters and in all seasons, CC is found to increase with AOD550. On the other hand, CWP-AOD550 and WV-AOD550 relationships appear more complicated and are discussed also in view of their impact on CC.

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