



Modeling winter ozone episodes near oil and natural gas fields in Wyoming

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Wintertime ozone episodes have been reported in the oil and natural gas (O&NG) producing fields in Uintah Basin, Utah and the Upper Green River Basin (UGRB) in Wyoming in recent years. High concentrations of ozone precursors facilitated by favorable meteorological conditions, including low wind and shallow boundary layer (BL), were found in these episodes, although the exact roles of these precursor species in different O&NG fields are to be determined. Meanwhile, snow cover is also found to play an important role in these winter ozone episodes as the cold snow covered surface enhances the inversion, further limits the BL and the high snow albedo greatly boosts photolysis reactions that are closely related to ozone chemistry.

In this study, we utilize model simulation to explore the role of chemical compositions, in terms of different VOC groups and NO_x , and that of the enhanced photolysis due to snow cover in the UGRB ozone episodes in the late winter of 2011.