

Simulation of Hydrocarbon Compositions from Oil and Gas Production in the Uinta Basin

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Abstract:

We will compare concentrations of hydrocarbon compounds that have been measured in the Uintah Basin since winter 2019 by the distributed canister system with emission data and with simulated quantities by the CAMx photochemical model. There were 5, 10, 4 deployments of the distributed canisters in winters 2018-2019, 2019-2020 and 2020-21, respectively, across various locations in the Basin to measure hydrocarbon compounds under daytime and nighttime conditions. Averaged hydrocarbon compositions from the measurements are compared against the emission inventory for oil and gas production in the Basin in base year 2017. Furthermore, the measurements are compared with simulated hydrocarbon compositions obtained from CAMx simulation episodes in 2013 and 2019. Latest hydrocarbon compositions developed from recent measurement campaigns in the Basin are incorporated into the CAMx model. Preliminary results show less reactive compounds are simulated in the model in comparison with measurements, and the CAMx still under perform ozone concentration for winter 2019 episode. A sensitive study using CAMx simulations with the latest emission measurements from natural gas-fueled engines are also performed and analyzed for its implication on ozone and hydrocarbons simulation performance.