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Poster
Quantifying methane emissions from oil and natural gas production in the Denver-Julesburg (DJ) basin in Colorado is of interest to stakeholders and policymakers. This study employs observations from the TROPOspheric Monitoring Instrument (TROPOMI) satellite to derive methane emissions over the DJ basin by utilizing the flux divergence technique. The collocation of agricultural and oil and gas operations in the area presents a challenge when trying to quantify oil and gas methane emissions only. In order to address this issue, we 1) look at potential seasonal changes in methane emissions, assuming that only agricultural emissions follow a seasonal cycle and 2) calculate NOx emissions from concurrent TROPOMI NO2 observations, assuming that oil and gas production areas exhibit higher NOx emissions compared to agricultural sources.
We also address the well-known bias of the TROPOMI operational methane retrieval on changing surface albedo. While the operational methane column we use includes a bias correction, we refine the existing correction specifically for our study area. For this purpose, we have developed a seasonal correction algorithm that is composed of 12 monthly models trained in a deep transfer learning environment. We found that the types of crops grown in certain regions in Colorado and their seasonal changes leads to corrections of up to 6 ppb. Here, we will present our latest results, discuss the impact of the refined albedo correction and the suitability of retrieving source separated methane emissions using the flux divergence method.
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