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Modelling of methane emissions from offshore oil platforms in the Norwegian sea

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Methane is a major greenhouse gas that has increased since the pre-industrial era and reducing its emissions is potentially an effective way of mitigating the radiative forcing in the short term. The oil & gas industry has a positive contribution to the global atmospheric methane budget with fugitive emissions from infrastructure installations such as offshore oil platforms. As part of the United Nations Climate and Clean Air Coalition (UN CCAC) objective to quantify global CH₄ emissions from oil and gas facilities, a series of aircraft campaigns have been carried out in the Norwegian sea among other areas. We report on the Lagrangian modelling activity of the emissions and transport sensitivities used to support the flux assessment. Source identification has been carried out based on backward modelling and has proved useful to interpret observations from the in situ airborne platforms. In addition, forward modelling of the emission plume in high resolution has been applied to constraining the plume height for mass balance methods assessment. Dependency of the resulting uncertainty of the flux estimates on various factors such as the choice of the meteorology and the of the Lagrangian model parameters is also discussed.