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HO_x during AQABA campaign

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The Middle East has exceptional environmental qualities, with intense solar radiation, extensive deserts and water scarcity that promotes dust mobilisation. Furthermore, the region is subject to high levels of air pollution due to emissions from traffic and petrochemical industry. The AQABA (Air Quality and climate in the Arabian BAsin) field campaign took place in summer 2017 covering a ship track from Toulon to Kuwait through the Mediterranean, around the Arabian Peninsula and back.
As one of the most reactive oxidants in the atmosphere, the hydroxyl radical (OH) is a driving force in air chemistry. It is produced photochemically by UV radiation and can react with most VOC emitted by biogenic or anthropogenic sources. Its close chemical relative, the hydroperoxyl radical (HO_2) is a major source of tropospheric ozone. HO_x (OH and HO_2) play a role in the production of aerosols via the formation of low volatility compounds like organic acids. Production and loss of HO_x are impacted by dust through its influence on photolysis frequencies and uptake of HO_x precursors. Additionally, uptake of HO_x oxidation products on dust particles increases their hydrophilicity and therefore may change chemical and physical surface properties.
During the AQABA campaign, HO_x was measured using laser-induced fluorescence (LIF) to investigate the regional influences on HO_x concentrations and budgets. This study contrasts HO_x concentrations and OH recycling between different environmental conditions along the ship track. This includes the Arabian Gulf at very high temperatures, with dust events, petrochemical industries and ship traffic, compared to the pristine environment over the Arabian Sea, and European dominated air masses over the Mediterranean Sea. The measurements will be compared to calculations obtained using the CAABA/MECCA box model.