1.183 A decade of satellite-derived maritime NOx emissions over Chinese Seas.

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Abstract:

Using the inversion algorithm DECSO version 5 we derived monthly NO_X emissions on a 0.25 x 0.25 degree resolution over East Asia for an 11-year period (2007 to 2017) based on OMI observations. We used these emissions to analyse trends and seasonal cycle of maritime emissions over Chinese seas. No effective regulations on NO_X emissions have been implemented for ships in China, which is reflected in the trend analysis of maritime emissions. The effect of maritime emissions on the air quality over land will be discussed. Simulations by an atmospheric chemistry transport model show a notable influence of maritime emissions on air pollution over coastal areas, especially in summer. The satellite-derived spatial distribution and the magnitude of maritime emissions over Chinese seas are in good agreement with bottom-up studies based on the Automatic Identification System of ships. We will further show how the new high resolution observations of TROPOMI on Sentinel 5p are expected to enhance the accuracy of maritime emissions in the future.