

Variability of atmospheric ammonia and its sources over Indian region

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Abstract

This study will present the spatial and temporal variability of the atmospheric ammonia gas (NH₃) over one of the major hotspots for NH₃ in the world i.e. Indo Gangetic Plain (IGP) region. Due to limited ground observations from India, we have always been dependent on satellite observations. And studies so far have always identified and highlighted the abundances of ammonia levels in IGP regions. This study also presents the comparison of IGP and non-IGP regions from India which will be the first kind to highlight the various sources in India along with agriculture.

Keywords: Atmospheric ammonia, Indo-Gangetic region, Air quality

1. Background

Ammonia gas (NH₃) is a primary pollutant both as a precursor to particulate matter and for ecosystem impacts. Sources of ammonia include agricultural activities (farming, livestock, fertilizer activities) and non-agricultural activities such as vehicle exhausts, industrial processes, landfills, combustions. Out of all identified sources, agricultural sources have been considered the dominant one and India being an agricultural economy have all the possible sources. Through limited ground measurements from the India and satellite observations, Indo Gangetic Plain (IGP) region has been always identified as a largest and rapidly growing hotspot for NH₃. Due to its detrimental impact on air quality, ecosystem health, climate it is crucial to identify the sources of ammonia in India so that emission reduction can be done sector-wise. Although IGP region has been considered as a hotspot for ammonia, the non-IGP region has shown a comparable abundance of the pollutant. We observed there are regions other than IGP in India shows relative high concentration through spatial and temporal analysis if compared globally.

2. Objectives

The study attempts to answer two major questions; (1) the status of atmospheric NH₃ from the Indian region and its temporal variation. (2) How the IGP region and non-IGP region compares in terms of atmospheric NH₃ levels providing information on spatial variability of NH₃ in Indian region. The present study will provide key information on the various sources of the NH₃ different parts of India.

3. Results

Results of the study will be presented in detail at the conference.