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**Abstract**

Aerosols significantly impact the regional environment, including climate change, specifically in periods of extensive biomass burning (BB). Emissions and properties of BB aerosols are highly source-dependent, depending on burning practice, combustion phase (open flaming vs. smoldering), and type of biomass. Quantification of BB emissions is in the focus of current research and abatement strategies, especially given that the impacts of BB on regional air quality in highly populated areas are remaining rather uncertain. This work reports the measurements during the dry season of 2013 in Son La Province, northwest Vietnam, and of 2015 in Ba Vi Province, Central Vietnam. We focus on physico-chemical properties of aerosols, affected by biomass burning activities from agricultural and domestic combustion sources. The characterization of near-source emissions from traditional burning activities (on-field burning and domestic cooking) as well as traffic emission is specifically conducted in order to identify the major functional groups in ambient smoke.

**Sample Collection**

- **Dekati 3 stage cascade impactor PM10**
- **MiniVol**

**Organic/inorganic content by FTIR spectroscopy**

- **Mode: DRS**
- **Resolution: 4 cm\(^{-1}\)**
- **Number of scan: 100**
- **Background: Atmosphere**

**Son La Biomass burning season, 2013**

- **Observatory station, So La (21.33°N, 103.9°E)**
- **24 February - 8 April 2013**

**Bavi biomass burning season, 2015**

- **Bavi province near Hanoi about 60 km.**
- **27 May – 15 June 2015**
- **Post-harvest rice straw burning**

**Conclusions**

- Specific features of on-field emission: nitrocompounds, ammonium, carbonate carbonyls
- Ambient aerosols: ammonium is prominent
- Amines on days of low smoke have a biogenic origin, they absent in high smoke periods.
- Specific features of coarse particles are dust functionalities: sulfates, silicates, and carbonates.
- Ambient aerosols PM\(_{2.5}\) : relative concentrations of organic functionalities are increased with increasing smoke levels.

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