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Title:	Comparative Study of Biomass Burning Organic Aerosols in Melpitz
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Abstract:	<p>The purpose my work was to identify the sources of organic aerosols at twin sites in Melpitz, Germany. Prior to my analysis, Field measurements were conducted from November 3rd, 2018, to February 28th, 2019, at two locations within Melpitz: Melpitz town and Melpitz station. A comparison of aerosol measurements between these sites under connected flow conditions allowed me to determine local emissions originating from Melpitz town. A paired t-test was employed to assess aerosols with significant concentration differences in the town. The biomass burning tracers syringe aldehyde, 4-nitrocatechol, vanillic acid, acetosyringone, coniferyl aldehyde, syringic acid, homovanillic acid, vanillin and vanillic acid were found to be traceable to fresh biomass burning aerosols from local wood burning stoves. 2-methyl-4-nitrophenol showed a statistically significant difference and could be traced to a local coal burning stove likely located closer to the station than to the centre of town. Furthermore, Positive Matrix Factorization (PMF) analysis was conducted for both the town and station datasets to estimate the various factors contributing to organic aerosols in Melpitz. I identified a total of six factors that explain the pollution in Melpitz town, and five factors that explain the pollution at the station. Among them, are four long-range factors: marine emissions from the Mediterranean Sea and Atlantic Ocean, coal burning emissions from Czech Republic and Austria, organic tracers associated with the aqueous phase oxidation of SO₂ from the same region and aged biomass burning tracers in continental air masses from SE Europe and the Balkan. The first three of these factors typically contribute equal mass both at the station and in town. The aged biomass burning factor also has a minor contribution from aging of local biomass burning emissions that result in minor differences between the mass seen at both twin stations. Furthermore, two local factors were identified: local biomass burning emission, and traffic emissions. Traffic emissions were only found in town, not at the station. Local biomass burning was found at both sites. While fresh emissions accounted for more than 30% of the total mass in the PMF in town, long-range transport explained almost 90% of the mass in the PMF at the station.</p>
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