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### Development and Field Development of the Volatility and Polarity Separator-Aerosol Mass Spectrometer

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# DEVELOPMENT AND FIELD DEPLOYMENT OF THE VOLATILITY AND POLARITY SEPARATOR-AEROSOL MASS SPECTROMETER

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It has been widely recognized that organic aerosol (OA) particles make up a large fraction of submicron particulate mass which impacts both human health and global climate radiative forcing. The formation of secondary organic aerosol (SOA) has recently been recognized as a major contributor to much of the total atmospheric OA, but uncertainty remains surrounding its formation mechanisms, chemical precursors, and the influence of anthropogenic and biogenic emissions. Although controlled lab experiments are crucial to gaining an understanding of these processes, *in situ* field measurements are necessary for identifying SOA formation sources and transformation pathways in the atmosphere. The field deployment of the Volatility and Polarity Separator-Aerosol Mass Spectrometer at the Jefferson Street site in Atlanta, Georgia, aims to answer some of these questions.

The VAPS-AMS is a modified version of the previously developed thermal desorption aerosol mass gas chromatograph (TAG) system with major changes targeting improvement in time resolution and mass throughput. The VAPS-AMS system aims to obtain volatility and polarity resolved data with the increased total OA mass analysis. The Jefferson Site field campaign marks the first deployment of the VAPS-AMS for *in situ* measurements following a variety of hardware modifications. Data analysis for the VAPS-AMS ambient sample is performed using a variation of traditional factor analysis called Positive Matrix Factorization (PMF) which explains the data by a certain number of factors, giving each factor its own profile and details its contribution to the total OA over time. The VAPS-AMS collected ambient sample data through August 24. Pre-processing steps and preliminary analysis of the data has begun; however, a more complete analysis including PMF will be the next step as the project continues.