# Grasping Polarimetric Coordinate Conventions

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Typically, aerosol retrieval algorithms are instrument-specific to accommodate the diversity of remote sensing architectures and data products. A generalized aerosol retrieval, such as GRASP, can merge simultaneous observations across multiple platforms into a single retrieval. The appreciation and correct interpretation of polarimetric observations require transformation between different coordinate system definitions which can vary among instruments and algorithms. The definition of a polarimetric coordinate system for a particular instrument or algorithm can be communicated unambiguously in three specifications. The three specifications are (1) the reference plane, (2) if the angle of linear polarization (AoLP) is equal to zero in this plane or perpendicular to it, and (3) whether positive AoLP is clockwise or counterclockwise. These polarimetric coordinate system conventions are different for the Airborne Multiangle Spectropolarimetric Imager (AirMSPI) and the Generalized Retrieval of Atmosphere and Surface Properties (GRASP). In this work methods for transforming between polarimetric coordinate systems will be demonstrated for the purpose of performing GRASP retrievals from AirMSPI datasets. Retrieval results from the Fire Influence on Regional to Global Environments and Air Quality (FIREX-AQ) will be shown.

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