



## **Temporal evolution of aerosol derived from N2-Raman lidar at a Mediterranean coastal site**

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Following the temporal variability of the aerosols in the atmospheric column on coastal areas is challenging. In situ ground-based or integrated column properties are not enough to understand the sea-continent exchange processes and identify the sources of particles. Now classical approach using the synergy between passive (e.g. sunphotometer) and active (e.g. backscatter lidar) instruments gives only a partial view of the aerosol properties, because they could be highly heterogeneous in the lower and middle troposphere. On June-July 2014, an automatic N2-Raman lidar (355 nm) was installed at a coastal site close to Toulon in the South of France. Using the coupling between cross-polarized elastic and N2-Raman channels, various aerosol natures are identified all along the time and against the altitude. Specific regularization algorithms have been tested to improve the aerosol classification. The results of these tests will be presented in terms of sensitivity studies based on the Monte Carlo approach. Selecting the most appropriate inversion method of the lidar profiles, the aerosol types encountered during the field campaign will be presented. We will also discuss their origin and the sea-continent exchanges including the sea breeze effect. We will see that a proper identification of particles passes through analyses coupling satellite observations and air mass trajectory studies.

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