### **Enhancing Aerosol characterization through a Virtual Research Environment**

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The **Virtual Research Environment (VRE)** serves as a collaborative platform designed to facilitate research activities across various scientific domains. By integrating diverse data sources, analytical tools, and computational resources, the VRE aims to enhance the accessibility and usability of data generated by research infrastructures (RIs). This environment fosters collaboration among researchers, enabling them to share knowledge and tools effectively, while promoting interdisciplinary studies.

In this talk, the results of the activities performed in the AERO VRE focused on the atmosphere domain are presented. Within the AERO VRE new software and tools have been developed specifically aimed at studying aerosol properties obtained by **lidar measurements**. This work involves the adaptation of existing algorithms and the creation of new analytical frameworks to process and interpret lidar data. Additionally, the properties of dust have been investigated by exploiting model s**imulations** and **satellite data**. By leveraging the capabilities of the VRE, the codes specifically designed not only enhance the analytical capacity for aerosol typing and dust characterization but also promote the sharing of methodologies and findings within the research community. This collaborative effort is essential for advancing our understanding of atmospheric phenomena and their implications for climate and air quality.

**Keywords: Virtual Research Environment, Lidar Observations, Aerosol properties, Typing, Dust**