

**Seminar on Physics and Chemistry  
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## **Extending XBAER algorithm for volcanic eruptions**

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### **Abstract**

The eXtensible Bremen Aerosol/cloud and surface parameters Retrieval (XBAER) algorithm is operationally used to derive aerosol, cloud and surface properties from various satellite instruments. This talk focuses on the latest development for the retrieval of Aerosol Optical Thickness (AOT) in presence of volcanic eruptions using OLCI (Ocean Land Colour Instrument) onboard Sentinel-3. Due to the lack of accurate aerosol type parameterisation for volcanic eruption, there is typically limited AOT data coverage retrieved from passive remote sensing. This leads to 1) low quality AOT data product with limited data coverage; 2) difficulty for further quantifying aerosol climate effect when assimilating satellite derived AOT into climate models. This talk shows the first attempt to harmonize the aerosol optics between satellite and model communities. The new aerosol optics is then used to describe volcanic aerosol type in the XBAER algorithm. The updated XBAER algorithm is applied to the scenarios of Hunga Tonga volcanic eruption. The results indicate that coverage and data accuracy of the AOT dataset for volcanic eruptions are significantly improved by the updated algorithm.