



FRontiers in dust minerAloGical coMposition and its Effects upon climaTe (FRAGMENT)

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Soil dust aerosols are mixtures of different minerals, whose relative abundances, particle size distribution (PSD), shape, surface topography and mixing state influence their effect upon climate. At present, Earth System models represent poorly the local/regional variations in dust mineral composition mainly because 1) our knowledge of the global soil-surface mineralogical composition is limited due to a lack of observations, and 2) there is an incomplete understanding of the emitted dust PSD in terms of its constituent minerals that results from the fragmentation of soil aggregates during wind erosion. The first challenge is being tackled by the Earth Surface Mineral Dust Source Investigation (EMIT), which will use a hyperspectral sensor mounted to the exterior of the International Space Station (ISS) to determine the mineral composition of natural sources that produce dust aerosols around the world.

We present FRAGMENT, a European Research Council Consolidator Grant started on October 2018 whose main goals are to 1) understand the emitted dust PSD and mineralogy and its relationship with the parent soil, 2) anticipate new methods to efficiently use in models the wealth of surface mineralogical information that will be provided by EMIT in the near future, and 3) contribute to understand the role of mineralogy on climate through modeling. We will focus on goals 1 and 2 of FRAGMENT, which include coordinated field campaigns in Spain, Morocco, California and Iceland between 2019 and 2021, and discuss how they advance our understanding.