
Photochemical aerosol formation in Titan's atmosphere

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Résumé

Photochemically produced aerosols are common among the atmospheres of our solar system and beyond. Observations and models have shown that photochemical aerosols have direct consequences on atmospheric properties as well as important astrobiological ramifications, but the mechanisms involved in their formation remain unclear. Titan's extended and methane rich atmosphere provides us a unique opportunity to investigate these mechanisms, with the help of observations from the Cassini-Huygens mission. I will discuss how the formation of aerosols in Titan's upper atmosphere is directly related to ion-neutral chemical processes in the ionosphere, as well as, how the subsequent heterogeneous reactions on their surface affect their growth. Because all planetary atmospheres possess ionospheres and regions of intense photochemistry, the mechanisms identified here can be efficient in other environments as well, modulated by the chemical complexity of each atmosphere.

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