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New measurement constraints on aerosol origins in the High Arctic

Michael Lawler

University of California at Irvine

Low, mixed-phase clouds play a major role in the summertime Arctic energy budget. The summertime high Arctic is a unique marine region with very low inputs of aerosol particles available to act as cloud condensation nuclei. Cloud or fog formation is actually limited by aerosol concentrations at times. The nature of the natural particles found in this region remains highly uncertain, and there occur puzzling events during which 10-50 nm particles increase dramatically in number. Are these particles mostly biogenic gels derived from the surface ocean? Are they mostly newly formed particles nucleated from the gas phase? I will report on initial results of size-resolved aerosol composition measurements from an icebreaker expedition to the North Pole to address these questions.