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# An Arctic CCN-limited cloud-aerosol regime

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On average, airborne aerosol particles cool the Earth's surface directly by absorbing and scattering sunlight and indirectly by influencing cloud reflectivity, life time, thickness or extent. Here we show that over the central Arctic Ocean, where there is frequently a lack of aerosol particles upon which clouds may form, a small increase in aerosol loading may enhance cloudiness thereby likely causing a climatologically significant warming at the ice-covered Arctic surface. Under these low concentration conditions cloud droplets grow to drizzle sizes and fall, even in the absence of collisions and coalescence, thereby diminishing cloud water. Evidence from a case study suggests that interactions between aerosol, clouds and precipitation could be responsible for attaining the observed low aerosol concentrations.