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## Can HULIS and Black carbon explain the absorption properties of Polar snows and their effects on the rate of photo-production of radicals in the snowpack?

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The climatology and photochemistry of snowpack is dependent on the optical properties of snowpack. Nanogram quantities of light absorbing compounds in a single gram of snow can reduce the albedo, light penetration depth and photochemical production of chemicals such as hydroxyl radicals and nitrogen dioxide within the snowpack. We will present results from the Arctic (Barrow) and Antarctic (Dome C) demonstrating that the light absorbing compounds in snowpack are consistent with a HULIS/HUMIC component and a black carbon component. The contrast between the clean Dome C (Antarctica) and the dirty Barrow (Arctic) snowpacks is striking, but the same components can explain all the absorption behavior. We will demonstrate how increasing or decreasing the black carbon content of the snow reduces snow photochemical production, albedo and light penetration depth for shortwave solar radiation. The work is from two papers that are to be shortly submitted

### Please list some keywords

photochemistry nitrate hydrogen peroxide black carbon HULIS absorption radiative-transfer hydroxyl

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