



The fourth soot-on-snow experiment (SoS) on natural snow in Finland

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The fourth soot-on-snow (SoS) campaign was conducted in March-April 2018 at an abandoned airport close to the Sodankylä observatory (67°23' N, 26°36' E, north of the Arctic Circle) of the Finnish Meteorological Institute (FMI). The campaign was part of the Novel Assessment of Black Carbon in the European Arctic (NABCEA), a project funded by the Academy of Finland. The specific goals were to study the processes and properties of snow contaminated by light-absorbing impurities. The most active phase of the campaign took place on March 19 - 24 when soot from wood burning and oil burning as well as some soil dust from Iceland was spread on snow. We also applied three different types of fertilizers to monitor melt and albedo changes, with the spot of 5.6 g l⁻¹ Scotts Super Bloom (12-55-6) fertilization being frequently camera recorded. After spreading the impurities snow properties were measured manually by making snow pits and taking samples for subsequent analyses. Snow albedo was measured continuously. Compared with earlier SoS experiments we made some major changes. We homogenized the ground of the experimental area with gravel before the snow season to avoid surface effects on the melting rate. Another major change was that we used a blower that removes large particles. For the measurements we added an instrument that measures the specific surface area (SSA) of snow.