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Black Carbon and Light-absorbing impurities in the Antarctic Peninsula

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Assessing the albedo response due to light-absorbing impurities (LAI) in coastal snowpacks has become of great interest in the light of the 'Antarctic greening'. Reductions in the albedo (triggered by a change in air temperature or by the LAI deposition) can also enhance feedback mechanisms; as the albedo drops, the fraction of absorbed solar energy increases, which leads to additional albedo drops.

Here we assess the presence of Black Carbon (BC) and LAI in coastal snowpacks in the Antarctic Peninsula. The BC-equivalent contentwas assessed by applying the meltwater filtration (MF) technique to snow samples taken at 7 locations in theAntarctic Peninsula, from latitude 62^{o}S to latitude 67^{o}S. BC-equivalentconcentrations exhibited significant geographical differences,but were found to be generally lower than 5 ng/g (in the range of those reported for the Arctic Ocean and Greenland). Moreover, the Angstrom coefficients were found to be particularly high at the northern tip of the Antarctic Peninsula,likely due to the snow algae presence. After the onset of melt, red snow algae bloom, significantly affecting the surface albedo, as shown by our measurements.