

TOTAL MERCURY CONTENT IN INLAND SNOW AND THEIR IMPLICATIONS FOR MERCURY DYNAMICS IN ANTARCTICA

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ABSTRACTS

The total mercury concentration (Hg_T) determined from surface snow and snow pit samples collected at Dome Fuji in East Antarctica provided new information on mercury dynamics in inland Antarctica. The Hg_T ranged between 0.20 and 10.8 $\mu\text{g g}^{-1}$ and mean mercury sequestration rates were 1 - 3 $\mu\text{g cm}^{-2} \text{yr}^{-1}$. Spatial and temporal profile of Hg_T and comparisons with other elements revealed that mercury behaves uniquely in the Antarctic interior. The seasonal variation in Hg sequestration was characterized by summertime maxima, even though the peaks were not always exactly in phase with sulfate or ^{18}O . The summer Hg_T peaks may be related to the active photochemical dynamics of mercury. However, its impact on Hg sequestration is limited to a few $\mu\text{g g}^{-1}$. We ascribe the interannual change in Hg sequestration to the variation in the atmospheric circulation over Antarctica, which regulates the meridional transport of aerosols containing oxidant precursors, continental dust, moisture and heat, each of which is thought to play a role in the mercury dynamics on the Antarctic Plateau.