Snow chemistry studies of a high alpine snowcover on the examples Wurtenkees and Goldbergkees (Hohe Tauern, Austria)

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Since 1987 the concentration of the major ion species Cl^{2-}, SO_4^{2-}, NO_3^-, Na^+, K^+, Ca^{2+}, Mg^{2+}, H^+, $NH_4^+$is investigated for the examples of Wurtenkees and Goldbergkees (Hohe Tauern, Austria). The steadily growing time series is used to analyse deposition and concentration patterns and their change in time.
The concentration of the major anions was tested on a trend during the time period 1987 to 2006. SO_4^{2-}showes a remarkable decrease about 41% at Wurtenkees and 38% at Goldbergkees, whereas $Cl^{2-}$and NO_3^-remain constant. A principal component analyses was used to find out the main sources of the major ion species. In the period 1987 to 2006 the first principal component on both investigation sites is composed of Cl^{2-}, $Na^+$and K^+, which gives indication for sea salt aerosols as their source. The second pricipal component contains NO_3^-, SO_4^{2-}, and NH_4^+, which can be assigned to anthropogenic activities. $Ca^{2+}$and $Mg^{2+}$are the ions combined in the third principal component. Mineral dust can be assumed as the primarily source of these ion species. Those three principal components explain 60% of the ion species variance at Wurtenkees and 70% of their variance at Goldbergkees.