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Measurements of nitrous acid (HONO) on the high alpine research station "Jungfraujoch"

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In the present pilot study, an optimized LOPAP instrument (DL 0.2 pptV, time response 6-7 min) for the detection of nitrous acid (HONO) in the atmosphere was tested for the use in polar studies on the high alpine research station "Jungfraujoch" at 3580 m altitude. Caused by the large ice and snow fields, the temperature range in this November 05 campaign and the low pollution level, the station is considered as an ideal test station for polar measurements.

The excellent performance of the instrument was confirmed in this study also under extreme weather conditions. HONO concentrations in the range <0.5-50 pptV with a mean value of 7.5 pptV were observed on the "Jungfraujoch". The diurnal profiles obtained showed clear maxima at noon and minima with very low concentration during the night supporting a proposed photochemical production of HONO on snow and ice surfaces. It was demonstrated, that interferences of wet-chemical HONO instruments can significantly influence the measurements, especially at low HONO concentrations. However, for the LOPAP instrument these interferences are corrected for by a two-channel design, which was recently validated in different intercomparison campaigns against an optical instrument (DOAS).