



## Supplement of

## Analysis of elevated springtime levels of Peroxyacetyl nitrate (PAN) at the high Alpine research sites Jungfraujoch and Zugspitze

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**Figure S1.** Cluster average surface SRRs for the larger North Atlantic domain and for (left: a, c, e, g) JFJ and (right: b, d, f, h, i) ZSF. Larger SRR indicate a larger sensitivity of the samples air masses to surface fluxes (emissions or deposition). The sampling locations are given by a light blue circle.



**Figure S2.** Cluster average latitude-altitude distribution of SRRs for the larger North Atlantic domain and for (left: a, c, e, g) JFJ and (right: b, d, f, h, i) ZSF. The sampling locations are given by a light blue circle.



Figure S3: Source sensitivities at the surface (top right), the total column (bottom left) and in two altitude cross sections (top left and bottom right) for situation with potential stratospheric influence at JFJ on 23 May 2008.



Figure S4: Frequency of AWS types in the months April and May and the years 2001 to 2010; (a) only types "convective-anticyclonic flat pressure" and "convective-indifferent easterly advection", which were mainly encountered during the high PAN episode in May 2008, and (b) all "convective-anti-cyclonic" and "convective-indifferent" types.