



Supplement of

Regional heterogeneities in the emission of airborne primary sugar compounds and biogenic secondary organic aerosols in the East Asian outflow: evidence for coal combustion as a source of levoglucosan

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Figure S1. HYSPLIT-based backward air mass trajectories as a function of arrival height (m) (see
color bar in each panel) and MODIS-fire counts for the TSP collected over Gosan according the four
seasons, (a) winter, (b) spring, (c) summer, and (d) autumn.



Figure S2. Time series of the concentrations of anhydrosugars, primary sugars, and sugar alcohols
during the period of study in Gosan.





Figure S3. Temporal variability of mass concentrations of trehalose and non-sea-salt Ca²⁺ in TSP
 collected over Gosan during April 203-April 2014.





Figure S4. Seasonal variability of molecular distributions of anhydrosugars, primary sugars, sugar
 alcohols, isoprene-SOA tracers and monoterpene-SOA tracers in their total mass concentration of

respective group-types in TSP samples collected over Gosan during April 2013-April 2014.



Figure S5. Diagnostic ratios of 2-methylglyceric acid/2-methyltetrols (2-MGA/2-MTs) and *cis* pinonic acid+pinic acid/3-methyl-1,2,3-butanetricarboxylic acid (P/MBTCA) in Gosan TSP samples
 collected during April 2013-April 2014.