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Supplement of

In situ chemical composition measurement of individual cloud residue particles at a mountain site, southern China

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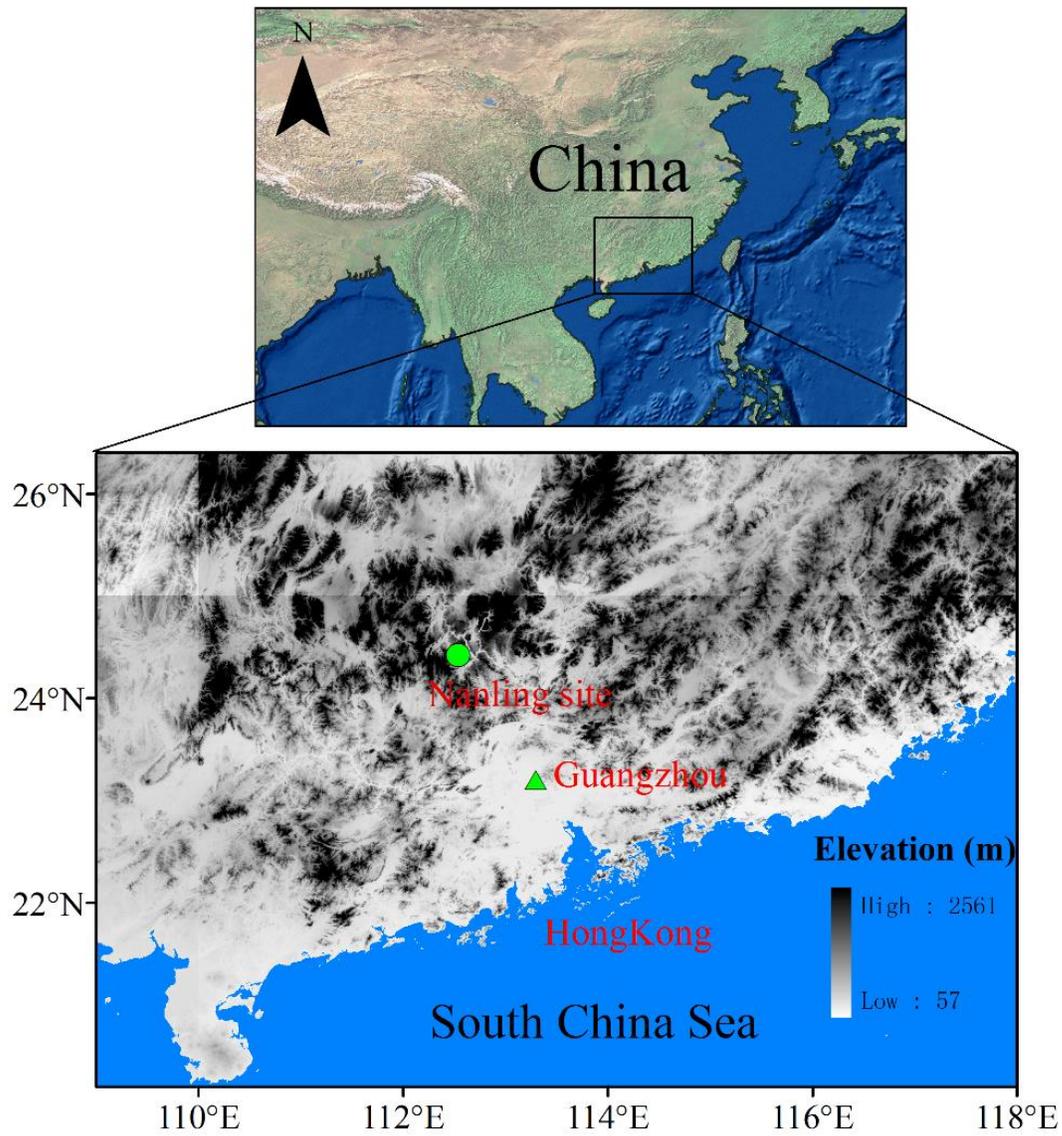
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20 Table S1: Time and detected particle counts of cloud residues, ambient and non-activated
 21 particles.

	Start	End	Number of particles
Cloud residues (Southwesterly)	16-01-2016, 12:00 21-01-2016, 00:00	17-01-2016, 00:00 22-01-2016, 00:00	1784
Cloud residues (Northerly)	18-01-2016, 20:20	19-01-2016, 01:00	4032
Ambient (Northerly)	18-01-2016, 15:00	18-01-2016, 20:00	2774
Cloud residues	From 10:00 21 Jan to 13:00 23 Jan ^a		1558
Non-activated			1063

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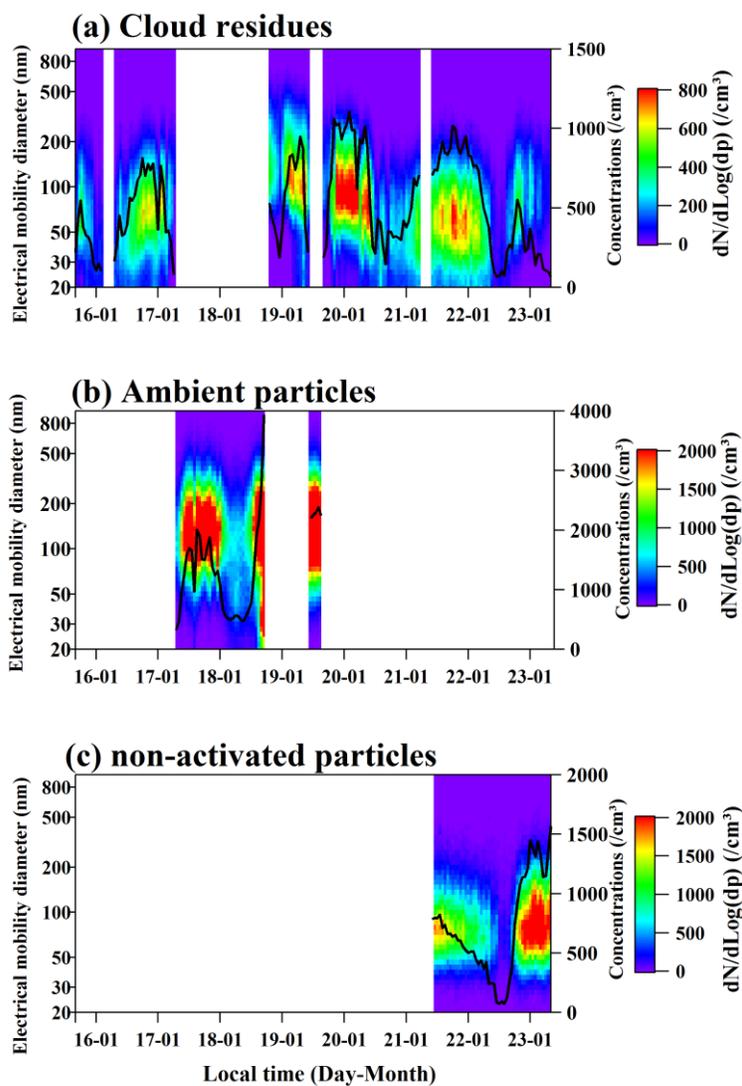
23 a: From 10:00 21 Jan to 13:00 23 Jan, cloud residues and non-activated particles were alternately
 24 sampled with an interval of one hour.



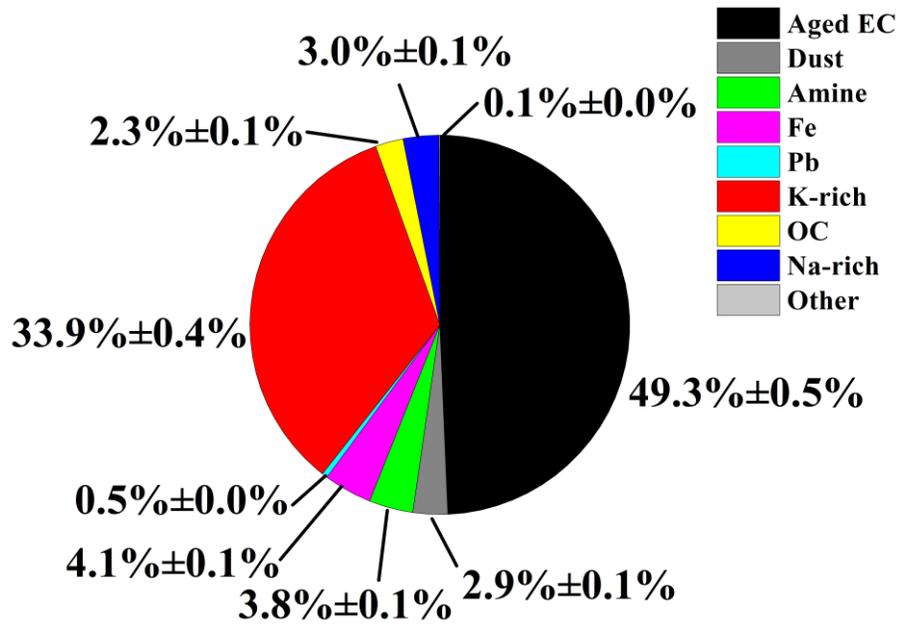
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26 Figure S1: The map for the study site.

27



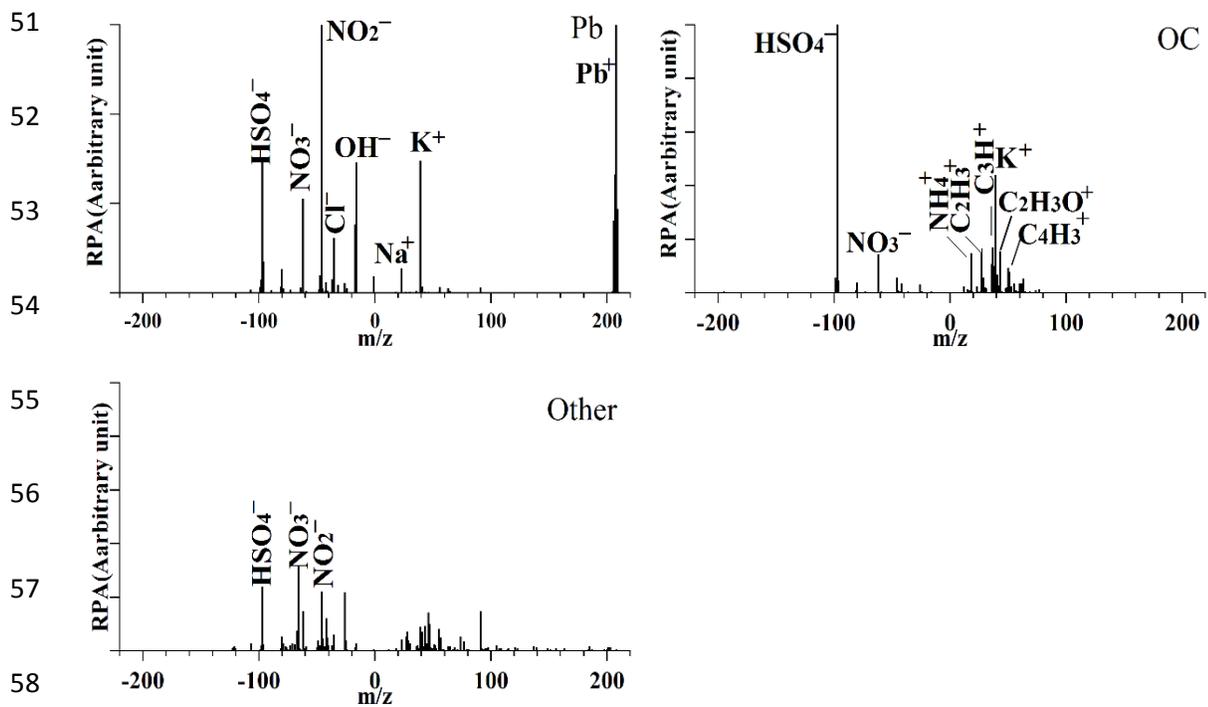
40 Figure S2: Size distribution (electrical mobility diameter 20-900 nm) of cloud residues (a),
 41 ambient (b) and non-activated (c) particles were measured a scanning mobility particle sizer
 42 (SMPS). Black lines represent particles concentrations integrated by the SMPS. The data of cloud
 43 residual concentrations was corrected by the enrichment factor and transmission efficiency of the
 44 GCVI. Note that the SMPS occurred a failure at 02:00 -07:00 on 16 Jan and at 08:00 - 09:00 on 21
 45 Jan.



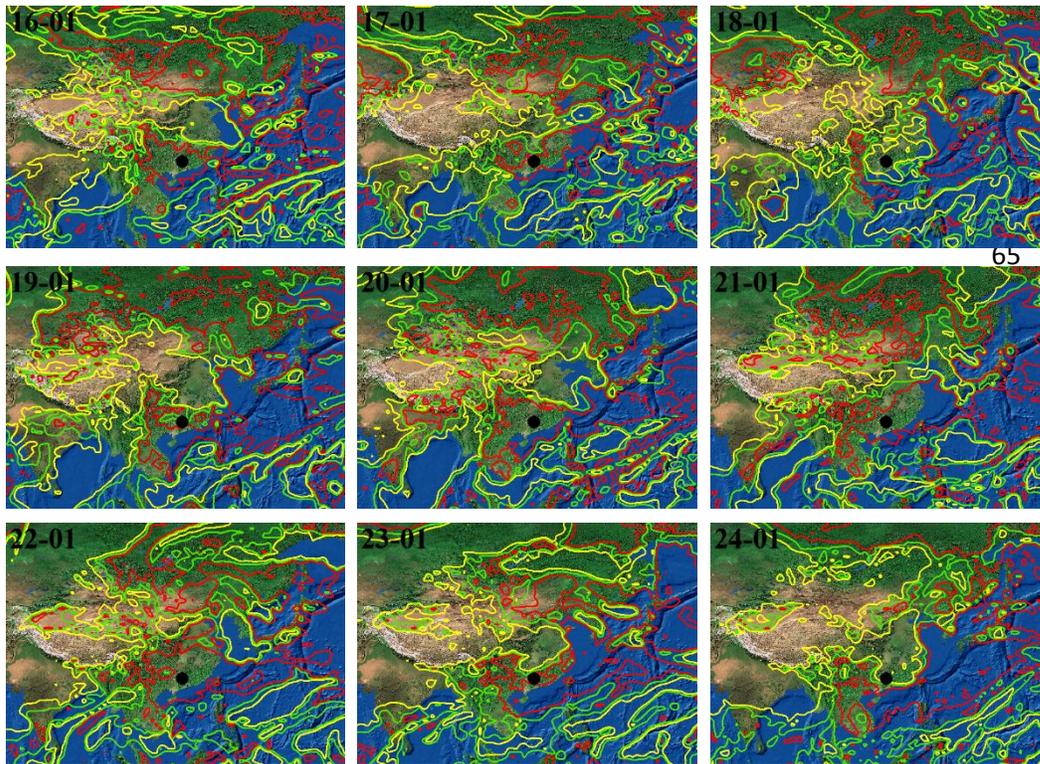
47

48 Figure S3: Number fraction of the cloud residues during the whole study period. Uncertainties
 49 were calculated assuming Poisson statistics for analyzed particles.

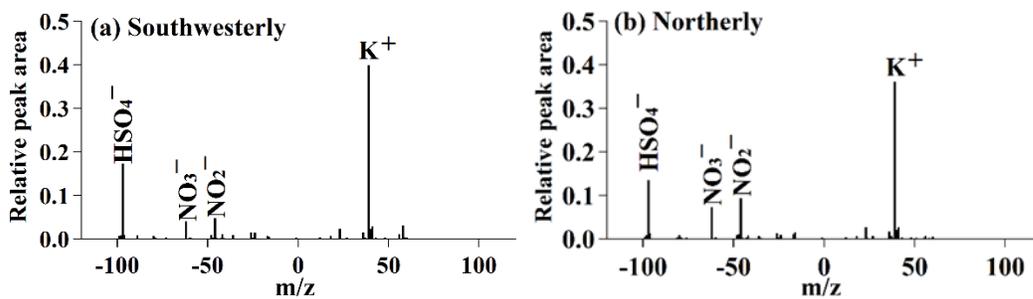
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59 Figure S4: Averaged positive and negative mass spectra for Pb, OC and Other types of the
 60 sampled particles during the whole sampling period. RPA in the vertical axis refers to
 61 relative peak area. m/z in the horizontal axis represents mass-to-charge ratio.

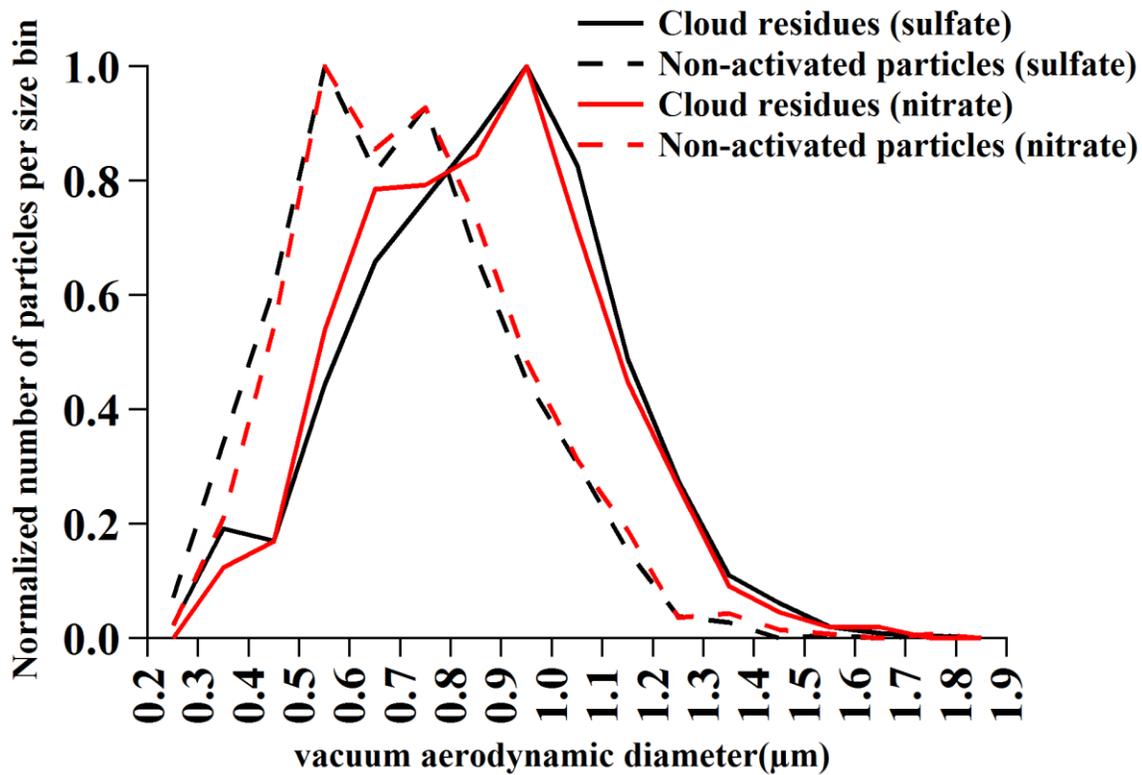


71 Figure S5: At 850 hPa (about 1,500 m a.s.l), Contour lines (red lines) of relative humidity
72 90%; Contour lines (green lines) of relative humidity 70%; Contour lines (yellow lines) of
73 relative humidity 50%. Black mark represents the observed site. Data is available at
74 <ftp://arlftp.arlhq.noaa.gov/pub/archives/gdas1/>.



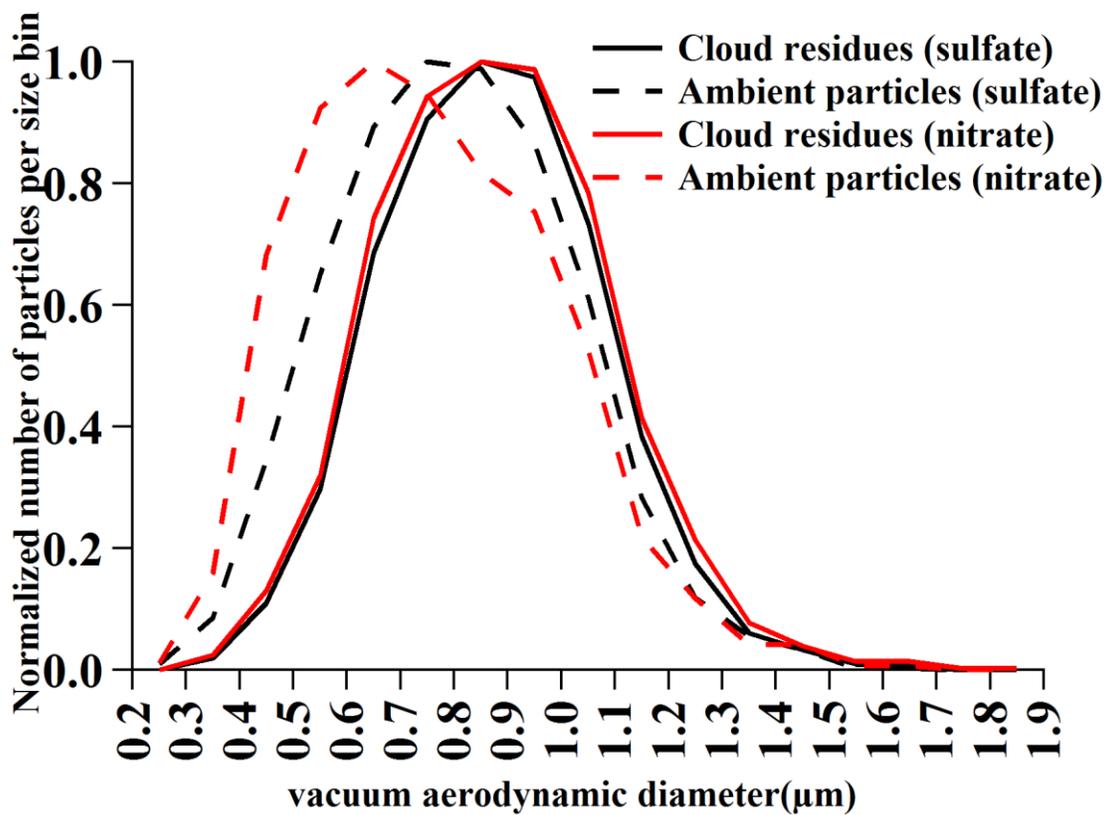
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76 Figure S6: Average mass spectra of K-rich residues for southwesterly (a) and northerly
77 (b) air masses.



78

79 Figure S7: Size distribution of sulfate- and nitrate-containing particles for cloud residues
 80 and non-activated particles.



81

82 Figure S8: Size distribution of sulfate- and nitrate-containing particles for cloud residues
 83 and ambient particles.