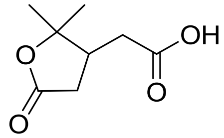
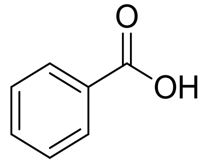
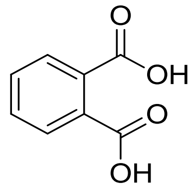
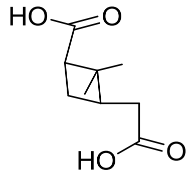
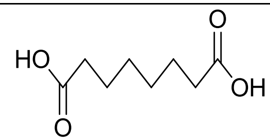
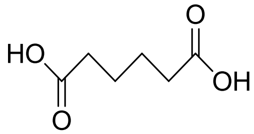
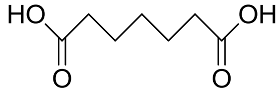
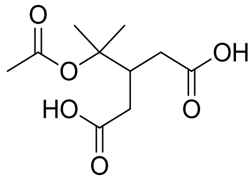
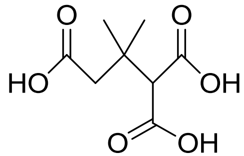
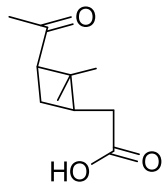
Table S1: The identified organic acids. Measured m/z, molecular weight, retention time, MS^2, molecular formula, structure and suggested precursor are listed. 1. (Claeys et al., 2009), 2. (Williams et al., 2010), 3. (Bunce et al., 1997), 4. (Szmigielski et al., 2007), 5. (Ma et al., 2007), 6. (Mochida et al., 2003) and 7. (Hatakeyama et al., 1987).

	Measured m/z	MW (Da)	RT (min.)	MSMS fractions	Molecular formula	Possible structure	Suggested precursor
Terpenylic acid	171.071	172.079	18.2	153.064; 127.175; 111.053	$C_8H_{12}O_4$		α-pinene[1]
Benzoic acid	121.033	122.041	27.5	77.038	$C_7H_6O_2$		PAHs[2-3]
Phthalic acid	165.024	166.032	18.8; 19.8	121.032; 77.038	$C_8H_6O_4$		PAHs[2-3]
Pinic acid	185.087	186.095	23.0	167.061; 141.073; 123.068	$C_9H_{14}O_4$		α-/β-pinene[4-5]
Suberic acid	173.087	174.095	25.3	155.090; 129.077; 111.054	$C_8H_{14}O_4$		Fatty acid[6]
Azelaic acid	187.103	188.111	28.1	143.075; 125.077	$C_9H_{16}O_4$		Fatty acid[6]

Adipic acid	145.054	146.062	14.8	127.062; 101.039; 83.013	$C_6H_{10}O_4$		Cyclohexene[7]
Pimelic acid	159.071	160.079	20.3	115.083; 97.071; 95.051	$C_7H_{12}O_4$		Cycloheptene[7]
DTAA	231.094	232.102	24.2	213.050; 171.042; 127.054	$C_{10}H_{16}O_6$		α-pinene[1]
MBTCA	203.062	204.070	16.1	185.019; 159.871	$C_8H_{12}O_6$		α-pinene[4]
Pinonic acid	183.107	184.115	25.5	165.111; 141.073; 139.091	$C_{10}H_{16}O_3$		α-/β-pinene[4]

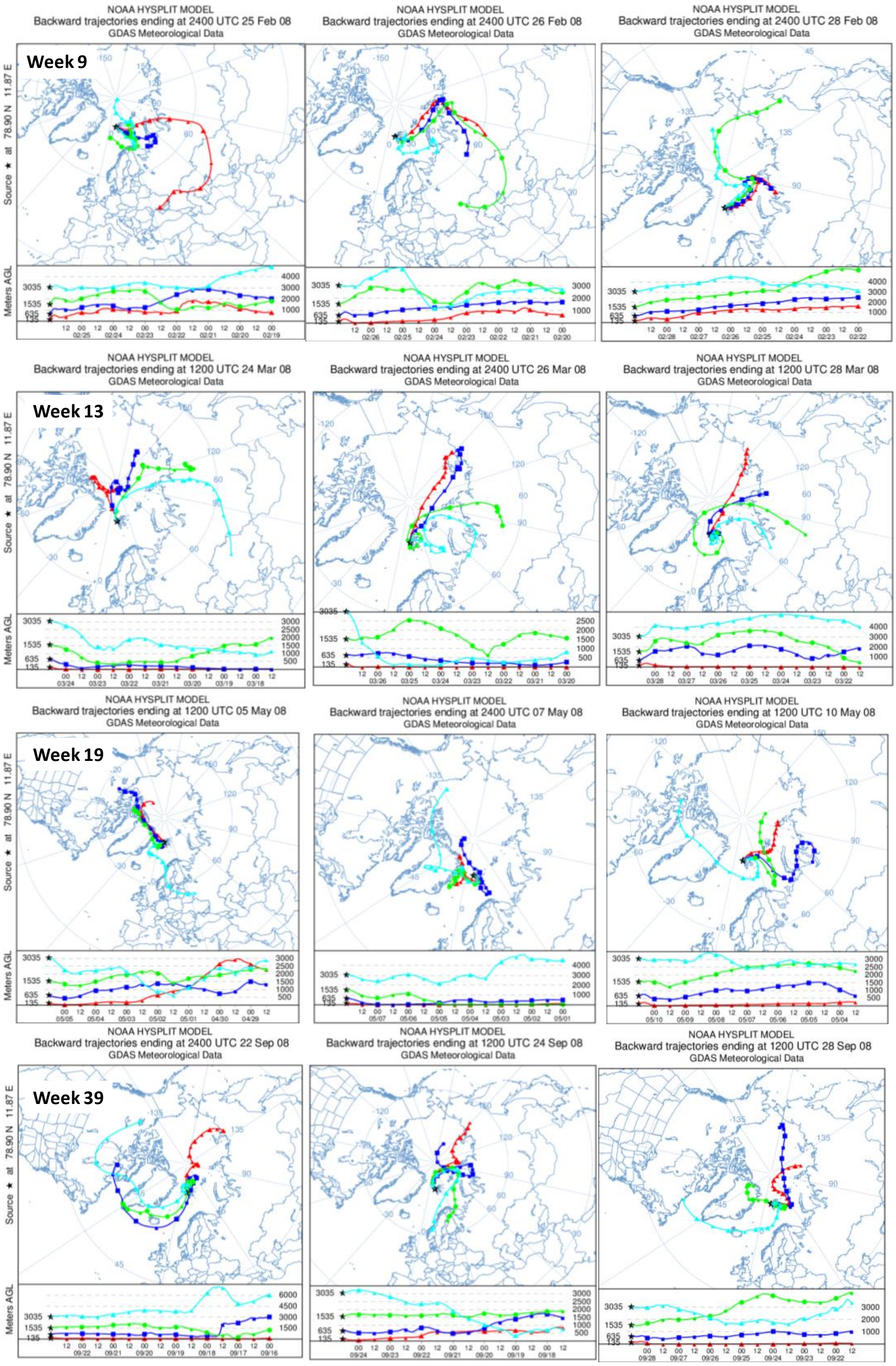
Trajectory analysis of transport from the tropics

A simple preliminary trajectory analysis was performed to investigate possible transport of aerosol from the tropics into the Arctic through vertical mixing between the boundary layer and the free troposphere.

The HYSPLIT model was used to model backward air trajectories for week 9 and 13 where OS 140, 154, 168 and 182 (suggested isoprene derived organosulfates) are present in the aerosol samples and in week 19 and 39 where they are not present. The arrival heights were set to ~10, 600, 1500 and 3000 m. above the Zeppelin station, and the trajectories were modelled 7 days backward every 12^{th} hour, ending at the Zeppelin station.

Figure S.4 shows examples of trajectory for each of the selected weeks. The results from the trajectory analysis showed a low degree of vertical mixing between the upper air trajectories and the lower trajectory in all four weeks (2 to 5 trajectories out of 14). Thus the preliminary analysis does not indicate that transport from the free troposphere into the Arctic affect the concentration of the suggested isoprene derived OS.

Figure S1: 7 day backward air trajectories ending at Zeppelin Mountain at four different heights: 10, 600, 1500 and 3000 m.a.g.l. in week 9, 13, 19 and 39.



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