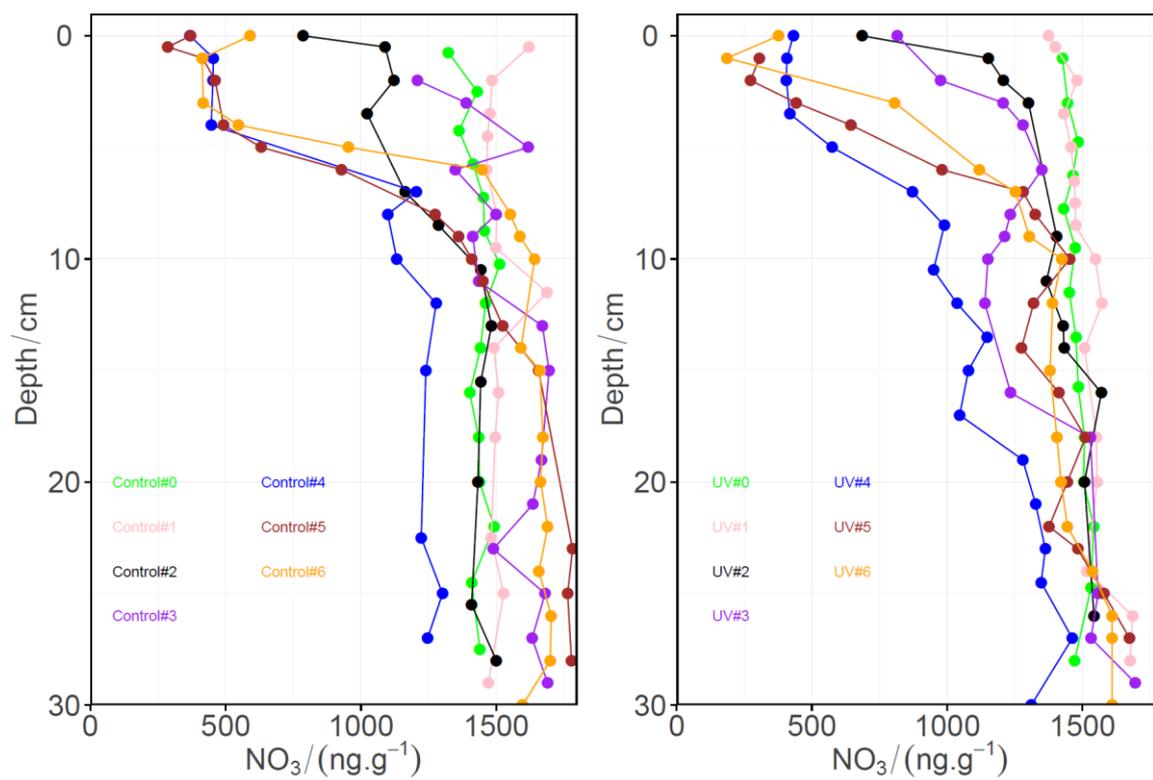


## **SUPPLEMENTARY MATERIALS**

The actual nitrate concentration data obtained from IC measurements in the warm lab at Dome C is shown below (Fig. 1). The calculated nitrate fraction remaining in the snow ( $f$ ) is given in Figure 2.

In the actual concentration measurement, we have observed a shift in the nitrate concentration at depth 20-30 cm, a zone that is stable in nitrate concentration. For each of the sets there is no actual loss or gain of nitrate, rather it is due to difference in the standards used for calibration and minor contribution from system variability while performing concentration measurements. It should be noted that there is no pattern with this observed shift and sampling number or depth.



*Figure 1. Actual nitrate concentration for the control and UV samples measured in the warm lab at Dome C. The observed shift in the concentration plot is not an actual loss or gain of nitrate and shows no correlation with the sampling period. It could rather be an artifact created by drift associated with the standards.*

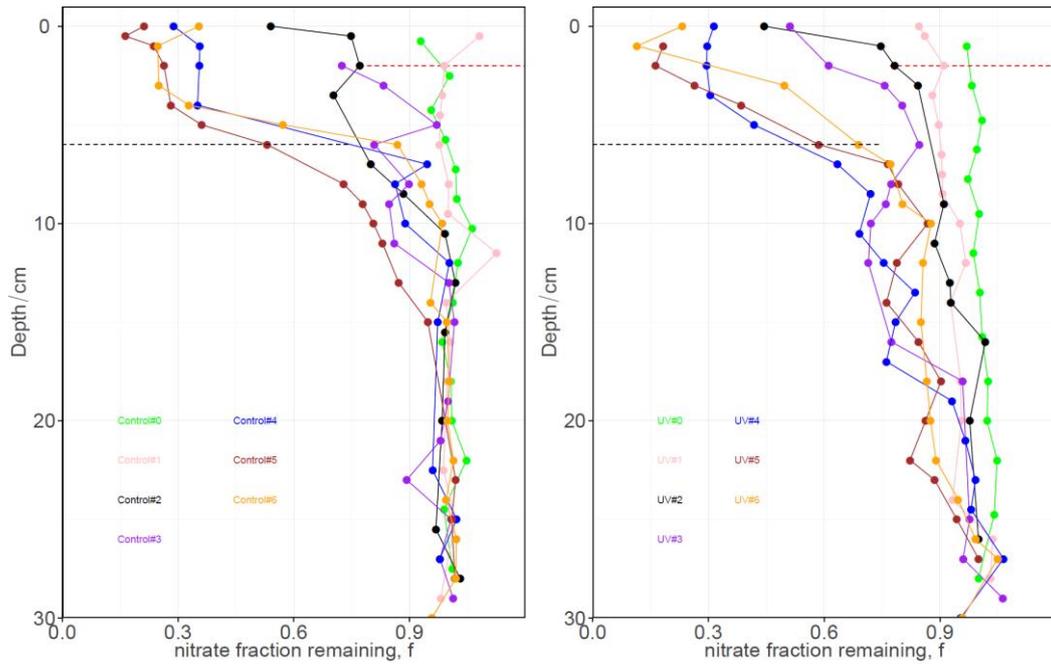


Figure 2. The nitrate fraction remaining in the snow plot for the control and UV samples (0-6). The horizontal dashed lines show the depth where mixing took place for samplings #0 - #3 (red) and samplings #4 - #6 (black).

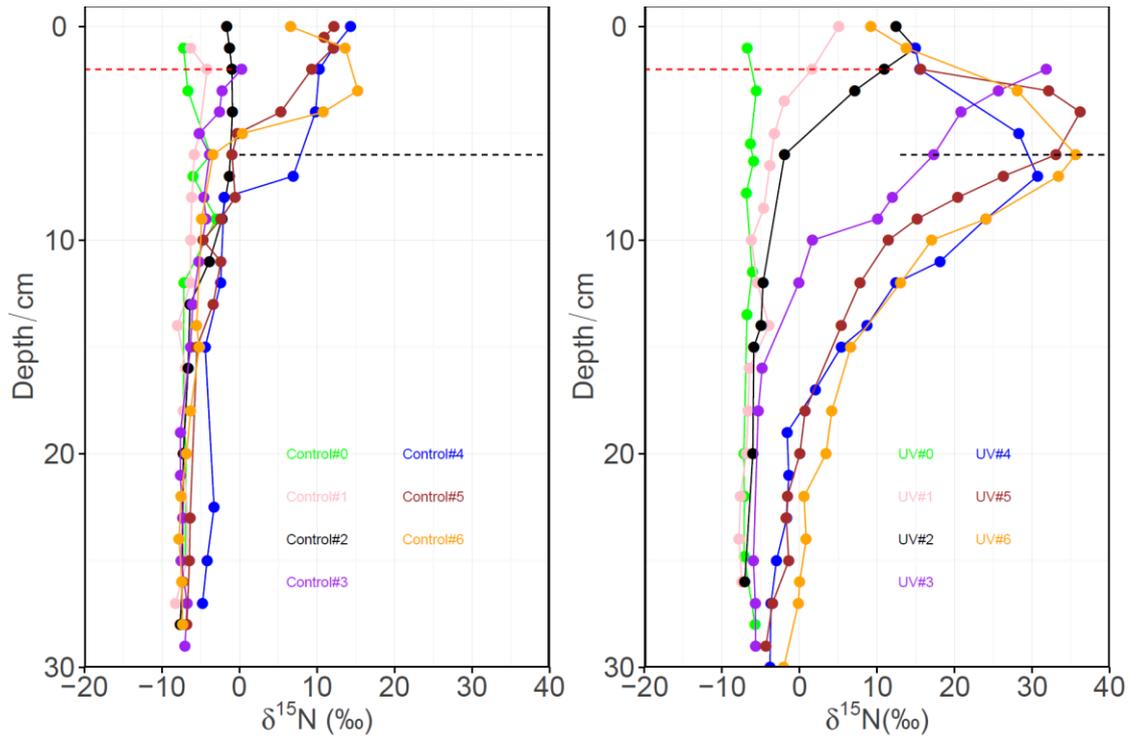


Figure 3. The  $\delta^{15}\text{N}(\text{NO}_3^-)$  profile in the snow pits with depth for the control (left panel) and UV (right panel) samples. The horizontal dashed lines show the depth where mixing took place for samplings #0 - #3 (red) and samplings #4 - #6 (black).

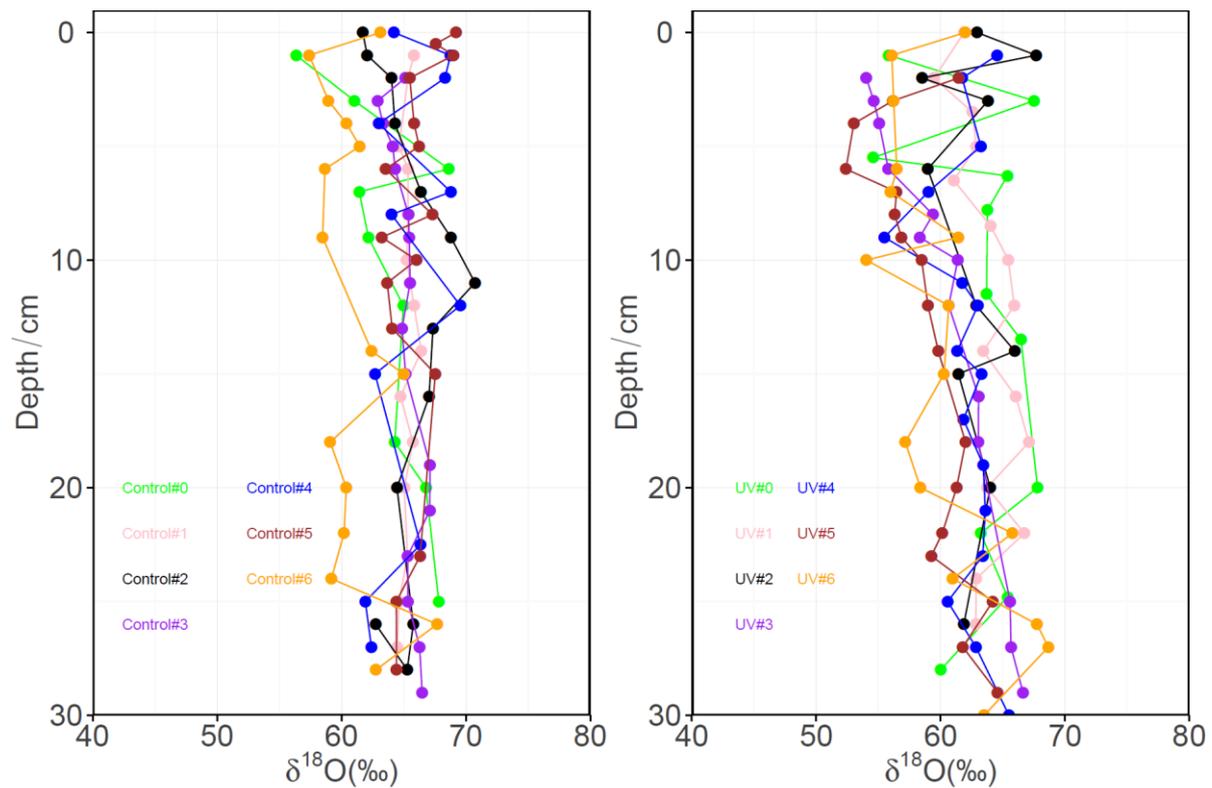


Figure 4. The  $\delta^{18}O(\text{NO}_3^-)$  profile in the snow samples with depth for the control (left panel) and UV (right panel) samples.

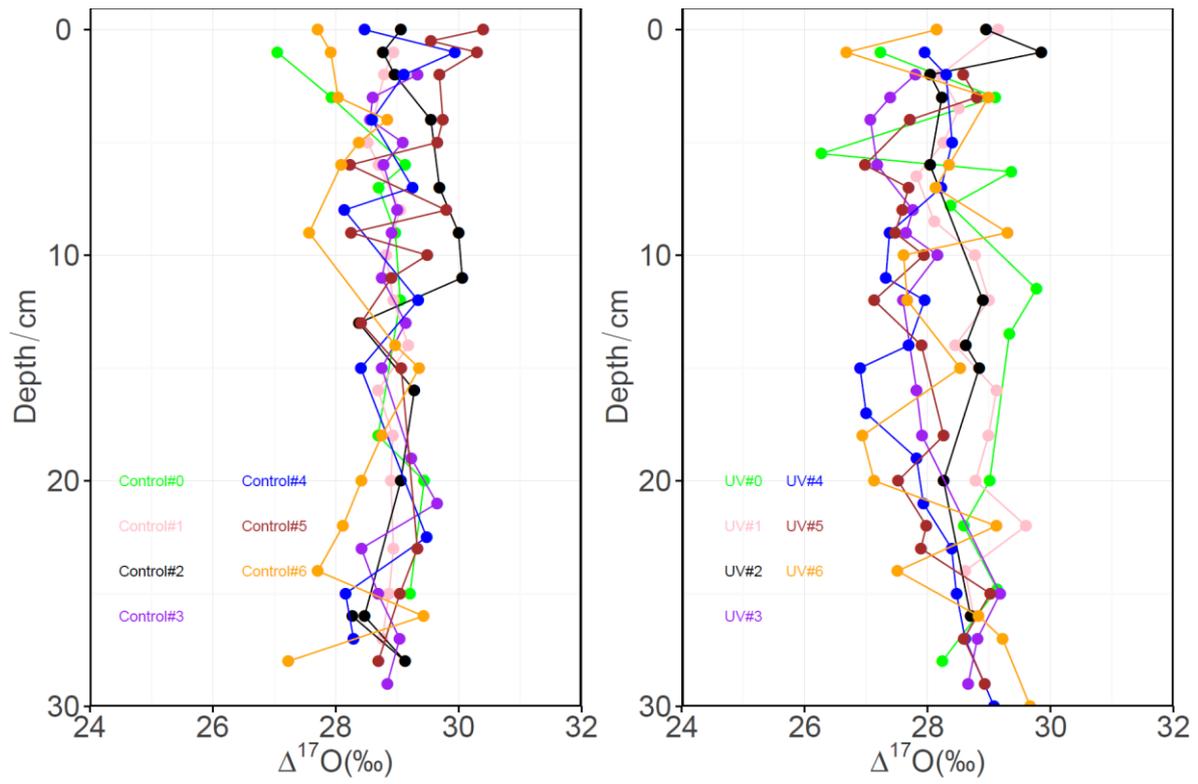


Figure 5. The  $\Delta^{17}\text{O}(\text{NO}_3^-)$  profile in the snow samples with depth for the control (left) and UV (right) samples.

Table 1. Field observation logbook during the experimental season in Dome C, Antarctica

Date	Observation/Remark
05/12/2011	Sublimation of few millimeters was noticed on control pit
08/12/2011	Drifted snow on both pits, was swept out
15/12/2011	5 mm sublimation observed in both pits
19/12/2011	Strong wind/ drifting snow
21/12/2011	Light snowfall, drifted snow was removed from the pits
30/12/2011	Control pit surface was 50 % covered with drifted snow, but no drifted snow on the UV-exposed pit
10/01/2012	At the surface level, 50 % of the non-UV and 20 % of the UV-exposed pits were covered with drifted snow
12/01/2012	Drifted snow covering the entire control pit and 20 % of the UV-exposed pit
20/01/2012	2-3 cm drifted snow on control pit and 3 cm drifted snow on UV-exposed pit