



## Branch-Level $\text{NO}_x$ Fluxes of Scots Pine

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We present some results from our measurements of nitrogen-oxide ( $\text{NO}_x$ ) fluxes of Scots pine. The fluxes were monitored using branch chambers at the SMEARII station in Hyytiälä, southern Finland. The site is located in rural area where the ambient  $\text{NO}_x$  concentration usually stays very low. The measured  $\text{NO}_x$  fluxes were small, consequently, the chamber blank needed to be determined carefully. Even when covered with Teflon film, the production of  $\text{NO}_x$  on the chamber walls was significant. It depended on the solar ultraviolet radiation, and it constantly increased while the Teflon was not replaced.

Also the pine shoots produced  $\text{NO}_x$  when UV light was present. We have been investigating the possibility that the emissions from the chamber and the shoots would originate from nitrate/ $\text{HNO}_3$  photolysis on the surfaces. The branches inside our chambers accumulated more nitrate than the free branches since the chamber protected them from rain. Some preliminary results indicate that a small amount of nitrate in a chamber can cause a UV-dependent rise in  $\text{NO}_x$  concentration when measured with this kind of system.

Deposition of  $\text{NO}_x$  occurred rarely at our site because of the low  $\text{NO}_x$  concentrations. Sometimes in cloudy weather and with exceptionally high ambient concentration, the  $\text{NO}_x$  uptake into the stomata and the needle surfaces exceeded the  $\text{NO}_x$  production. We have studied how these two processes,  $\text{NO}_x$  consumption and UV induced production, determine the net  $\text{NO}_x$  flux and the compensation point of the flux in a pine branch.