Exchange of NO2 between spruces and the atmosphere is dominated by deposition

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The chemical budget of tropospheric ozone is largely determined by the concentration of NOx (NO and NO2), which is in remote areas related to biological activities of soils and vegetation. The atmospheric concentration of NO2 is strongly influenced by the bi-directional exchange between the atmosphere and plants. The exchange depends on stomatal compensations points in close relation to the NO2 concentrations in ambient air. It is accepted that NO2 uptake by plants represents a large NO2 sink, but the magnitude is still unidentified. A better knowledge of compensation point values for the bi-directional NO2 exchange is a matter of recent discussions, as accurate estimates would help to reliably classify vegetation types. In close relation to our previous studies of Betula pendula, Fagus sylvatica, Quercus ilex und Pinus sylvestris we investigated a further representative of conifers, Picea abies, under field and laboratory conditions. The measurements were part of the DFG joined project EGER (ExchanGE processes in mountainous Regions). We used dynamic chambers and a sensitive and highly specific NO-NO2-Analysator. CO2 and H2O exchange were measured simultaneously to assess physiological comparative parameters such as photosynthesis, transpiration and stomatal conductance. Additionally O3 concentrations were recorded, to detect and estimate chemical reactions within the chamber. During the measurements the NO2 exchange was obviously dominated by deposition and depended on stomatal conductance.