



Coherent Motion, Non – Local Transport and Segregation above Canopies

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We studied transport and chemical reactions in the atmosphere above canopies for several years. The turbulent flow in the unstable atmospheric boundary layer (ABL) above canopies is characterized by coherent motion. The total amount of down-drafts (sweeps) and up-drafts (ejections) together makes up to about 75% of the total flux for situations during field studies ATTO 2015 (rain forest canopy) and ECHO 2003 (deciduous forest) for momentum, sensible heat and moisture. For isoprene (ISO) and monoterpenes (MONO) as well as NO , NO_2 , O_3 , OH and $(HO_2 + RO_2)$ the contributions are different due to the relative amount and duration of sweeps and ejections. This type of analysis is also applied to the total OH - reactivity. The degree of inhomogeneous mixing of reactants (segregation) for reactions like $OH + ISO$, $NO + O_3$, $NO + (HO_2 + RO_2)$ can be related by the cumulative expansion method (CEM) (e.g. Katul et al., 1997) mainly to the influence of ejections.