

## 6.152 Path-dependent lifetimes: Observations and Models.

Early Career Scientist

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Abstract:

The distribution of most trace species within the troposphere depends on a complexity interplay between transport and chemical loss. Holzer and Waugh (2015) recently introduced the concept of a path-dependent lifetime,  $\tau_C(r)$ , that parameterizes the integrated chemical loss during transport to a given location  $r$ . Here we present estimates of path-dependent lifetimes of a suite of CFC replacement gases based on surface and aircraft observations. Chemical transport model simulations are then used to investigate the characteristics of  $\tau_C$ , its linkage to tropospheric transport and OH abundance. These simulations suggest that observational estimates of  $\tau_C$  may place useful constraints on the tropospheric OH.