



## **The effects of mixing on evolution of hydrocarbon ratios in the troposphere**

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The evolution of hydrocarbon ratios during atmospheric oxidation is often used as a measure of photochemical processing of an air mass as it is transported away from an emission region. However, mixing of air masses with differing photochemical histories precludes an unambiguous interpretation of measured hydrocarbon ratios as accurate, quantitative “photochemical clocks”. We examine the interaction of mixing and aging in air masses sampled during the 2004 ICARTT study in the western Atlantic and the 2002 ITCT 2K2 study in the eastern Pacific. The age spectra of tracers calculated by the particle dispersion model FLEXPART (Forster et al., 2004) provide a measure of the histories of the sampled hydrocarbons. Guidelines for the interpretation of hydrocarbon ratios as indicators of photochemical processing will be suggested.

Forster, C., et al. (2004), Lagrangian transport model forecasts and a transport climatology for the Intercontinental Transport and Chemical Transformation 2002 (ITCT 2K2) measurement campaign, *J. Geophys. Res.*, 109, D07S92, doi:10.1029/2003JD003589.