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1 Seasonal Variations of Nonmethane Hydrocarbons at Mace Head, Ireland.

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Continuous, in-situ measurements of C_2-C_5 alkanes, isoprene and benzene, toluene, m&p-xylene, o-xylene and ethylbenzene made at Mace Head research station, Co Galway, Ireland are presented. Two full annual cycles; containing twelve air samples a day have been collected since January 2004. Measurements were taken using the AGAGE (Advanced Global Atmospheric Gases Experiment) "Medusa" preconcentration system coupled with a gas chromatograph and quadrupole mass selective detector (GC/MSD). The predominant westerly winds bring, clean Atlantic air to the research station. This allows analysis of the Northern hemisphere background atmosphere, and can be used for comparison with pollution events; when Easterly winds bring European air to Mace Head. The seasonal variation of all measured NMHCs, excluding isoprene, show the same general trend, with a maximum in winter and summer minimum. Isoprene is the only biogenic NMHC measured and showed a summer maxima, however, elevated concentrations are also occasionally measured during winter pollution events, when they are strongly correlated with CO. Five-day back-trajectories have been used to differentiate between air parcels from four classes: southerly, westerly, arctic and European. The low NMHC concentrations are obtained from southerly transport to Mace Head and high concentrations from air parcels heavily influenced by European emissions. Trajectory modelling and air mass classification has been used to assess emission strengths and OH radical concentrations.