

Fast injection of stratospheric air to the lower troposphere - an ordinary feature of Northern Hemispheric midlatitudes?

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Balloons measuring ozone, humidity and temperature were launched daily from three sites in South-Eastern Canada for a month in July 2010 (Montreal-QC, Egbert-ON and Walsingham-ON). These profiles showed consistently deep stratospheric intrusions penetrating below 700hPa almost every day of the campaign. These measurements are compared to predictions from a new, high-resolution global Lagrangian tool for Stratosphere-Troposphere Exchange (STE) which has been operational at Environment Canada (EC) since July 2010. The Lagrangian STE tool is found to represent reasonably well the observed intrusions, but underestimates the ones penetrating below 700hPa. It shows that the frequency of such events in July 2010 was consistent with those found during the IONS campaign in August 2006 (Trepanier and Bourqui, 2010), suggesting that these events may be much more frequent than previously thought. This poster presents an analysis of the deep stratospheric intrusions measured during the July 2010 campaign and a validation of the high-resolution Lagrangian STE tool against these balloon sonde measurements. In addition, a high-resolution Northern Hemispheric one-year climatology of deep stratospheric intrusions across the 700hPa level will be presented as a result of the first year of operations of this Lagrangian STE tool. This one-year high-resolution climatology will help determine whether the unexpectedly high frequency of deep intrusions found in July 2010 did extend over a longer time-scale or whether it was just an exceptional month.