Atmos. Chem. Phys. Discuss., 3, S435–S436, 2003
www.atmos-chem-phys.org/acpd/3/S435/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Halogen Occultation Experiment (HALOE) and balloon-borne in situ measurements of methane in stratosphere and their relation to the quasi-biennial oscillation (QBO)" *by* P. K. Patra et al.

Anonymous Referee #1

Received and published: 23 April 2003

general comments This paper compares HALOE and balloon-borne in situ methane data and tries to explain its relation to the quasi-biennial oscillation. It is an interesting approach but a question of how to isolate QBO signal from in-situ four day data.

specific comments The comparison of balloon data in 1990(1987) to satellite data in 1997(2001) is not appropriate statistically. Even the direct comparison of satellite data in 1994 [refer to figure 2] to balloon data doesn't show any similarity. Their relation to the QBO phase is hard to be analyzed by the zonal wind shear at Hyderabad.

Randel et al. [JMS, 163-185, 1998, 'Seasonal cycles and QBO variations in strato-

spheric CH4 and H2O observed in UARS HALOE data'] is recommended as a critical reference.

When balloon-borne CH4 profile at specific date and location is analyzed, the corresponding synoptic wind field has to be analyzed together with the QBO phase. It is very hard to isolate QBO signal of the original data from annual, interannual, or other short term variations.

In figure 1 which is assumed to be the most important plot in this paper, the vertical profiles are hard to be explained by the corresponding zonal wind shear. When the descending rate of zonal wind shear region is considered, the vertical structure of each profiles doesn't show any consistent effect of vertical advection by relative vertical motion.

Comparison between balloon data and HALOE data is not approriately organized. To compare two different data sets, figure 2 has to have the same format with figure 1 or both figures have to be overplotted. From figure 2, the difference between the profile in 1994 and that in 1998 is very different from that in figure 1.

To discuss the QBO phase, Singapore zonal wind data is recommended instead of NCAP data.

In figure 7 caption, tropical upwelling is not due to the solar heating (refer to Andrews et al. [1987, Chapter 9] or Shepherd [2002, JMSJ, p770]).

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 1925, 2003.