

## ***Interactive comment on “Increasing synoptic scale variability in atmospheric CO<sub>2</sub> at Hateruma Island associated with increasing East Asian emissions” by Y. Tohjima et al.***

### **Anonymous Referee #1**

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Review of “Increasing synoptic scale variability in atmospheric CO<sub>2</sub> at Hateruma Island associated with increasing East Asian emissions: by Y. Tohjima et al.

#### General Comments and Questions

The paper present an interesting analysis of the CO<sub>2</sub> variability at Hateruma Island from 1996 to 2007 based on continuous measurements and atmospheric modeling. The article is clear and well written. I present here a few suggestions to improve the clarity and to support the conclusions of the paper.

Question 1: Could you do a model run with constant fossil fuel CO<sub>2</sub> emissions for East Asia (or China) and show that the CO<sub>2</sub> SSV at Hateruma Island is different from  
C4299

the observations. . . To separate the various source regions you could also consider tagging in the model the CO<sub>2</sub> and CH<sub>4</sub> coming from China versus Japan versus Korea versus Rest of the World.

Question 2: Would you consider doing 14C analysis on CO<sub>2</sub> samples to isolate fossil fuel emissions contributions?

#### Specific Comments by Section

P15726 Abstract:

Line 13: change to “as indicated in the Marland et al. [2007] emissions inventory data”. CDIAC here is a data center/repository not the author of the data set.

#### Introduction

Line 22: change to “Although there are international discussions to reduce. . .”

P15727

#### Introduction

Line 3: change to “Increasing fossil fuel CO<sub>2</sub> emissions in East Asia elevate. . .”

Line 12: Emission patterns of CO<sub>2</sub> and methane are not similar. . . May it be more that in the winter time, at a remote site like Hateruma Island, you will see emissions contributions from populated areas for both CO<sub>2</sub> and methane. . . The lifetime of methane is ~ 10 years so replace “(~month-year)” with “~decade or more”.

Line 22-23: Specify that you look at winter time data only.

P15729

#### Data and Methods

What do you use for biomass burning emissions and could you show a map of winter time emissions of CO<sub>2</sub> and methane for East Asia?

P15733 Discussion

Line 15: do you have a proper citation or web reference for the REAS inventory?

Question (same as above but in the context of the paper here): Could you do a model run with constant fossil fuel CO<sub>2</sub> emissions for East Asia (or China) and show that the CO<sub>2</sub> SSV at Hateruma Island is different from the observations. . . To separate the various source regions you could also consider tagging in the model the CO<sub>2</sub> and CH<sub>4</sub> coming from China versus Japan versus Korea versus Rest of the World.

Technical comments

P 15728 Line 13: fix typo: 4.6 cycles Line 18 remove "each other" P 15733 Line 28: when the backward trajectory first crosses the corresponding regional boundaries.

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Interactive comment on Atmos. Chem. Phys. Discuss., 9, 15725, 2009.