

## ***Interactive comment on “A field-based method for simultaneous measurements of the $^{18}\text{O}$ and $^{13}\text{C}$ of soil $\text{CO}_2$ efflux” by B. Mortazavi et al.***

### **Anonymous Referee #2**

Received and published: 12 May 2004

This paper covered basic but important research direction, because it is very important to study the sampling techniques in the determining of  $^{18}\text{O}$  of soil respiration flux. There are no problems about the materials and methods, and data analysis. However, some modification and improvements need to be done before accepted, as well as shortening (it seems a little too long at present).

Moreover, this paper will be enhanced if the authors have some results related to the effects of the soil water content, soil respiration rate (in different growth season or in different ecosystem), and time delayed effects of sampling (effects of volume of mini-tower combined with effects of soil respiration rates, only data of 2 minutes after install was presented in the paper), which can evaluate wide application of mini-tower technique.

### **Below are some general comments:**

The language needs improvements. Many sentences are not in good order, it is better

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to put the time and place in the end if no emphases on them, and some are confusing throughout the paper. It is suggested that the authors, should do some modifications carefully (better by native speakers of English).

The authors use the  $^{13}\text{C}$  or  $^{18}\text{O}$  instead of  $\delta^{13}\text{C}$  or  $\delta^{18}\text{O}$  in mistake frequently in the text and in the figure title. It is also mistakenly use soil  $\delta^{13}\text{C}$  instead of soil SOM  $\delta^{13}\text{C}$ .

Too many symbols of per mil after numbers are lost, which may happen due to the conversion from DOC to PDF format.

It is better to use  $R^2$  instead of  $r^2$ , the former are more common in the journal (however, it depends on the journal's style).

It is confusing to use "soil  $\text{CO}_2$ " to refer the "soil  $\text{CO}_2$  profile technique", as well as other two methods, it should be indicated clearly the abbreviation of each method at the first time use in the text and abstract.

Introduction part are a little too long, delete some common sense information and not important reference.

In Analysis of Methods part, it seems no necessary to re-describe the procedure in detail if they were published on formal international journal.

**Some specific details are following:**

**Abstract section:**

Line 6 in the text paragraph, "produce a Keeling plot" change to "...Keeling plots".

Line 12, "in contrast to chamber  $^{18}\text{O}$  Keeling plot", change to "...to that by chamber technique".

**Introduction:**

First paragraph,

Line 25, "Global budgets", change to "Global carbon budgets".

Line 3 to line 6, "Because ...1999)", change to: "Because ...the atmosphere, the

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determination...to be measured to estimate these budgets (...1999).

Line 8 and line 9, "its components (Yakir...)", change to "its components more exactly (or precisely) (Yakir...)."

Line 10 "been used for determining", change to "been used to determine".

Page 5, line 7: change sentence order to give objectives more clearly at the end of this part and delete or move out some ir-related information.

### Methods:

In first paragraph, change the digital of longitude and latitude into degree, which is easier to read.

Line 18, delete one "2003" because too many duplicate information about the year.

#### 2.1 Mini-tower

Line 24, "(Fig. 2)", change to "Fig. 1".

2.3 Soil CO<sub>2</sub> (page 7), change to "soil CO<sub>2</sub> profile..."

2.4 "Sequence of measurements", change to "Sequence of sampling"

2.5. Analysis, change to "Stable isotope analysis"

It is better to list out country and place of the instrument manufacture.

#### 2.6 Statistical considerations

Shorten this paragraph, because Model II method became the standard procedure to make Keeling plot, so, it is no necessary to detailed it too much.

### Results on page 9:

"The <sup>13</sup>C... (Table 3)", rewrite it into more concise format style.

### References:

It is suggested that the author should check each of them to meet the style of the journal, as well the abbreviation of journal name.

Change the order of two papers by Bowling et al. 2003.

Use "Tellu B" instead of "Tellus" throughout (they are two different journals because

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covered different fields).

### **Table and figures:**

#### Table 1

It is too huge to read and not clear, so it is better to delete each data from every mini-tower. If, give some statistical analysis (e.g. ANOVA) results between different methods

#### Table 2

It is better to rewrite the title and rearrange the table to more clear and concise style. It is quite confusing at present.

#### Table 3

Modifications see Table 1.

#### Figure 1.

Add some import detail size information (in cm) of the chamber and pipe, as well as probe of soil sampling.

#### Figure 2.

There is no general title of the figure. Put more data in one figure as possible, the scale of x-axis is too large.

#### Figure 3

Title: Line 1 "Depth..on...23 June 2003.", change to "Depth ... measured on...".

Line 4, "... (Table 2).", change to "... (Table 3)."

Put the measured site information onto the panel of figure directly or in the note following title.

#### Figure 5

Use the symbol of each kind directly inside the figure legend, instead of text description.

Line 1 in the figure title, "The  $^{13}\text{C}$  of root free soil samples." Change to "The SOM  $\delta^{13}\text{C}$  of root free soil samples at different depth".

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