The first part of the paper consists in a description of a new GC –ECD setup that significantly improves the SF6 measurement. Two important modification sets have been made: (1) the mass flow controllers (MFCs) were replaced by electronic pressure controllers (EPCs); (2) a Molsieve 5A column was added, the initial Porapak-Q columns were shortened and all the column temperatures were modified. I have two comments here:

1. A 3-column ECD setup that is conceptually similar (although implemented into a different GC) has been already described in detail in Moore et al., 2003. The authors should state clearly which is the significant advance or novelty that the present paper brings compared to Moore et al.

2. It is repeatedly declared or suggested through the paper that the new setup with three columns is the reason for the improved precision. However, other significant changes were made at the same time. Moreover, Fig. 4 strongly suggests that the most significant improvement for the lab GC occurred after the introduction of EPCs at the end of 2005, before the change to the 3-column setup. For the in-situ GC, the two changes (3-column and EPCs) were made at the same time, thus the improvement cannot be clearly attributed. Thus based on the evolution of the lab GC, I would rather assume that the improvement was due to the use of EPCs. The precision of the new 3-column system should be compared to the most recent one just before the change (i.e. after the EPC introduction), not only to the old setups.

Specific comments

- typo: page 4134 line 5: “Geller at al”
- page 4136 lines 17-23: does the SF6 signal to noise ration decrease with increasing CO2? If yes, could the SF6 measurement precision be even better at a lower level of CO2 doping?
- page 4141 lines 14-16: I think the calibration procedure should be explained in more
detail. The non-linearity cannot be estimated with only two calibration gases, but that's how I understand the text now.

- Fig. 4. What are the grey triangles and the black circles?
- Fig. 10. I suggest moving the model-SF6 red line to the upper plot.