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Interactive comment on "Methanotrophic activity and bacterial diversity in volcanic-geothermal soils at Pantelleria island (Italy)" *by* A. L. Gagliano et al.

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Thanks for revising and appreciating our manuscript. Please find here our answers to your comments and questions.

R.: There is a more recent balance you can cite, together with Etiope 2008, of volcanic methane in the context of global CH4 budget by Stefanie Kirshke et al. 2013 Three decades of global methane sources and sinks Nature Geoscience 6, 813-823.

A.: The paper of Kirschke et al. 2013, although very interesting, does not add new data on volcanic/geothermal methane emissions. In the paper these data are included in the wider emission category of "Geological sources (including ocean)" and are mainly

based on Etiope et al. 2008.

R.:The authors should explain here why are they doing this gas sampling along the profile and give more details on how are the probes done, length, for how long is the probe left on site, was it left on the site to equilibrate for how long? How much is the internal volume? It is not clear how do you sample the 20 ml of gas into the vial? I assume 20 ml are quite a big volume compared with the internal volume of the tube. Do you leave the syringe connected to the tube to equilibrate with the internal gas? Or do you use another system?

A.:The gas samples were collected simply to obtain their chemical composition and the analytical results are shown in par. 4.1 and discussed in par. 5. For the sampling we adopted the standard procedure for soil gas sampling in volcanic/geothermal areas, i.e. putting a tube inside the soil at the desired depth and sucking out the desired gas volume with a syringe and putting the sample through a three-way valve into a sampler for the analyses in the laboratory. The main difference in our case was that we put into the soil a probe with three tubes through which, at the same site, we could collect sequentially soil gas samples from 13, 25 and 50 cm depth. The volumes can be obtained from the dimensions of the tubes given in the text and the results are between about 0.4 and 1.6 ml. Considering also the connection to the syringe the total volume never exceeds 2 ml. For such sampling there is no need of equilibration time because the tube is driven into the soil with a core inside which is taken out before the connection to the syringe. To avoid atmospheric contamination the suction through the syringe is made very slowly (> 60 sec for 20 ml), the first stroke of the syringe is discarded and the second is collected. We added more details in the methods' section.

R.: Is the area of probing a strong degassing area of you have mostly soil and slow degassing?

A.:The samples were all collected in an area that previous studies (D'Alessandro et al., 2009) identified as strongly degassing. This has been now specified in the manuscript

R.:Please give more details on the gas measurement and sample handling for methanotrophic activity measurements. Do you take so many samples consequently in the same vial? Or you have replicates for each sampling time? How many replicates per treatment? How much gas do you sample each sampling event? I assume 1 ml loop needs at least 3 ml to flush it if the void is not previously made in the loop.

A.:For each soil sample we made the methane consumption experiments on two soil aliquots as specified in the manuscript. Gas chromatographic analyses were made sequentially on the same vial. The introduction system of the GC (total volume about 2 ml) is evacuated with a vacuum pump before the introduction of the sample and is provided with a pressure sensor to correct small (positive or negative) deviations from the introduction pressure (atmospheric) of the calibration standards. We added more details in the methods' section.

R.:The same needs to be done for Table 2, plus the units must be changes so to represent smaller numbers and to include the uncertainty of the estimate (st error or st deviation).

A.:Gas chromatography is a well established method for soil gas analysis and duplicate analyses are generally not made. The analytical precision of the method ($\pm$3%) has been specified in the methods' section. Furthermore, μmol mol-1 is one of the most used ways to report the results.

Interactive comment on Biogeosciences Discuss., 11, 5147, 2014.