Corrected parts are highlighted by blue fonts.

Referee#1

First sentence of Section3: do the Authors mean that the average flux measured for all azimuths at a given elevation is taken as the relative base level against which flux anomalies are defined?

There is a geomagnetic effect to make the azimuth distribution anisotropic (east-west effect). For example, most of the horizontal (>85 deg) 5-GeV muons from W are cut off by the geomagnetic effect. However, within the azimuth region of +/- 400 mrad (= the viewing angle of 45 degrees), this effect is suppressed for the muons arriving at the elevation >= 200 mrad (less than a few%).

We rewrote the sentence as follows:
Since we expect that the geomagnetic effect on cosmic-ray muon flux (east-west effect) is negligible within the detector's effective azimuth angle of -400 mrad $< \phi <$ +400 mrad, the azimuth distribution of muons from the sky (elevation of 600 mrad) was used to correct the data.

Page 880 (lines 2 to 5): the Authors explain that the backward flux is used to measure the open sky flux subsequently used to determine the acceptance of the detector. However, the horizontal scintillator bars of the detection matrices involved in the backward directions are not the same as those involved in the forward directions. Is the so-determined acceptance precise enough, being understood that the efficiencies of the scintillator bars are not identical?

Yes, the efficiencies of the scintillator bars are not completely identical between forward-directed and backward-directed events. Therefore, it is more useful for us to normalize the data with the forward-directed data from the sky. However, in our case, the target was within the entire detector viewing angles, and therefore, we had to use the backward-directed events for normalization. From my experience, if we use a combination of scintillators and PMTs with the highest yield rate (e.g. BC-208 and R7724), and applying the lowest discrimination level as possible, the individuality from each scintillation counter is highly suppressed. Fig. 3 shows the azimuth distributions at different elevations, where we can see the events from sky is almost isotropic for

negative angles (back-ward directed) as well as that from thick part of the target (+100 mrad: azimuthally isotropic EM shower-originated background).
We added the following sentences.

The combination of the scintillator strips to determine the arrival direction is different between forward-directed and backward-directed events. It is more useful for us to normalize the raw azimuth distribution with the forward open sky flux. However, in our case, the target was within the entire detector viewing angles, and therefore, the backward-directed events had to be used for normalizing data. By utilizing high yield scintilltors and PMTs, and by setting the lowest discrimination level as possible, the efficiency of the scintillator strips is suppressed. As shown in Fig. 3, the azimuth distributions at different elevations of sky is almost isotropic for negative angles (back-ward directed) as well as that from thick part of the target (+100 mrad), where the events are dominatated by the azimuthally isotropic EM shower-originated background.

Page 880 (lines 14 to 16): what is the expected background noise level caused by fortuitous events simultaneously hitting the two segmented planes of the detection apparatus?

It is difficult to quantitatively estimate it because the flux and energy spectrum of the EM shower depends on the location, elevation, and local topography around the detector. However, the extended air shower MC simulation compared the muon intensity arriving > 50 degrees (horizontal muons) in zenith and the intensity of multiple (>= 2) shower particles/m^2 (>10 MeV) arriving < 50 degrees (vertical EM particles) in zenith. The result was (horizontal muons):(vertical EM particles)=100:8. The vertically projected area of the detector is ~8% of the horizontally projected area. Therefore around 0.6% of the horizontal muon events (> 50degrees) is the roughly expected number of BG. As shown in Fig. 2, the ratio of the number of events from 100 mrad and -700 mrad is ~100 (2000/(30000*7/0.6)), which is consistent with the estimation.

We inserted the following sentences:
In order to roughly estimate the expected background noise level caused by accidental events simultaneously hitting the two segmented planes of the detector, the extended air shower MC simulation compared the muon intensity arriving at $\theta_{zenith} > 50^o$ (horizontal muons) in zenith and the intensity of multiple (>= 2) shower particles/m^2 (>10 MeV)

arriving $\theta_{zenith} < 50^{o}$ (vertical EM particles). By considering the vertical and horizontal projected area of the detector, roughly 0.6% of the horizontal muons can be counted as a background noise. As shown in Fig. 2, the ratio of the number of events from θ_{zenith}=100 mrad and -700 mrad is ~0.0057 (2000 /(350000), which is consistent with the estimation.

What is the time resolution of the acquisition system?

We inserted the following sentence.
The time resolution of the data acquisition system is 10 ns and, the width of the coincidence window between two planes was set to be 40 ns.

Page 880 (bottom lines): the Authors use the flux relative attenuation (with respect to the backward open-sky flux) to determine the variations of average density across the fault. In this a case, the muon energy cutoff corresponding to each trajectory is unknown and the absolute average density cannot be determined. As far as I understand, the Authors account for this situation by assuming an arbitrary reference density of 2 g/cm3 and determine density variations relative to this reference. Am I right? Could the Authors give some more details?

We rewrote the sentence as follows.
The reference density of 2.0 g/cm^3 was assumed and density variations relative to the reference were determined.

Please, could you precise the uncertainty of the topography model? Does this produce significant error bars in the profiles of Fig. 4?

We added the following sentences:
The reading error of the map is ±1.5 m, and the horizontal uncertainty of the topography model is ±1.0 m. This error corresponds to 2.5% for 100-m rock at maximum. The thickness of the line in Fig. 3 corresponds to 16 m.

Referee#2
One point I think should be mentioned is that it is only when the geology is well characterised that density measurements alone are likely to give useful porosity measurements, as otherwise differences in density may relate to different rock types.

We inserted the following sentence.

In conclusion, when the geology is well characterized, the present method is likely to give useful porosity measurements, as otherwise differences in density may relate to different rock types. Under this condition, the technique we reported in this paper can be used in ordinary soil where geothermal reservoirs are expected.

Abstract and through paper. The term is "fault gouge", not "fault gauge".

Corrected.

p879 Some of lines 1-9 are not very clear. I suggest

Each segmented detector consisted of two plane arrays of scintillator strips, one each in the x and y direction. Each scintillator strip used a plastic scintillator 70 cm long by 7 cm wide and 2 cm thick, and a 2-inch photomultiplier tube. The two arrays each had 9 counters. The path of a muon can be determined by the combination of two signals from an x and a y plane detector, which defined a 7 cm square within which the muon passed. The path of a muon can be determined by the locations of its signals at the two segmented detectors, which were separated by a distance of 70 cm.

We followed the referee's suggestion.

p880 Is zero azimuth angle the north direction, or along the fault plane?

We inserted the following sentence.

The azimuth angle of zero is along the geologically estimated fault plane.

Fig 4 The symbols are easy to confuse. It might make it easier if the symbols were different colours for each vertical angle.

Corrected.