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***Interactive comment on* “Characterising terrestrial influences on Antarctic air masses using radon-222 measurements at King George Island” by S. D. Chambers et al.**

Anonymous Referee #3

Received and published: 15 June 2014

The paper is describing one year of Radon-22 measurements at King Sejon station located in the Antarctica peninsula. Variabilities from diurnal to seasonal scales are characterized and analyzed with regards to the origin of air masses using local wind observations and back trajectories. The radon is measured with an analyzer already used in several sites.

I am much less convinced by the overview of the radon measurements at Antarctic stations, at least in the context of the KSG analysis. I think this section (4.1) is a different story and should be moved to another paper. The descriptions of the different measurements and their uncertainties, as well as the local characteristics of each station,

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would need more details. It would reduce the manuscript but deeper analysis of variations of trace gases measured at the station and correlations with the air mass regimes described for Radon, would be more in agreement with the purpose of the paper.

More specific comments:

p.3: "...its atmospheric lifetime is comparable to that of many anthropogenic emissions, ...": unclear statement

Section 2.2: it is not very clear what is the overall uncertainty for typical Radon concentrations at KSG ?

Section 3.4: together with the convincing fetch analysis using backtrajectories, it would be interesting to see the equivalent signatures for trace gases observed at the station.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 11541, 2014.

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