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***Interactive comment on* “On the use of radon for quantifying the effects of atmospheric stability on urban emissions” by S. D. Chambers et al.**

Anonymous Referee #3

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This paper gives a novel idea to use radon concentration for estimation of stability that controls dispersion of air pollutants. Many interesting data have been given in this paper during five-year observation; however, I think more careful investigation is required for the application to air pollution problems.

p25413,l4 and p25419,l4: Why is the nocturnal boundary layer shallowest just prior to sunrise? Are there any literatures? Because nocturnal boundary layer may develop as time passes with wind, the depth may not be shallowest near sunrise.

p25421 l28 (red line): There should be some days in which the daily minimum in the daytime is not clear. How did the authors treat such days?

p25423 l3: The condition for the quartile shown here is for Richmond case. The abso-

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lute value of concentration may differ in other places. More generalized criteria should be suggested in addition to the present one.

p25423 I6 Fig.6: Standard deviation of each category may give the information of scattering of the data, which suggest the representativeness of mean value.

p25425 I21: When the authors would like to say about the air pollutants, they should consider the difference of source characteristics from those of radon. For example, spatial distribution and time variation of these sources are much different from radon source. They should add these points to some extent around the measuring point at Richmond.

p25425, I3: I am wondering which types of SO₂ sources are dominant near Sydney, high stacks or near surface source. If the dominant source is high stack, the concentration in the daytime is high. On the other hand, if near surface source is dominant, concentration in the daytime becomes low. Fig.8 and Fig.9 suggest the source height is low; however, Fig.11b in winter case suggests the stack height is high (west fetch). Please explain this difference.

p25426 I2 Fig.8 and Fig.9: Why different unit is used for pollutants in Fig.8 from Fig.9? The different unit may cause to misleading.

p25426 I10 "Comparing ... for the radon scheme. In fact ... days".: The logic of these two sentences are unclear. Do these mean that the P-G method likely classify the case into "D" after sunrise when stable boundary layers still remains under sunshine?

p25428 I19 "...economical": Is that so? Isn't the cost of radon monitor expensive?

p25431 "Summary and conclusions" The method shown here may still be site specific. The remarks for the cases that this method will be applied to other observation site should be added. Because the characteristics of air pollution deeply depend on the distribution of sources of pollutants, I think it is not so easy to apply the radon method developed in this paper to other cities. The authors should show a strategy to imple-

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ment this method to a variety of cities, if possible.

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