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Interactive comment on “Changes in soil carbon sequestration in *Pinus massoniana* forests along an urban-to-rural gradient of southern China” by H. Chen et al.

Anonymous Referee #3

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The impact of urbanization on forest carbon sequestration is an important subject under global warming. Global soil is a major carbon stock, and the capacity overwhelms the atmosphere and vegetation, so slight change in the amount of C in the soil may dramatically influence atmospheric CO₂ concentration. The authors presented interesting results with 14 forests along the gradient from rural to urban. I suggest accepting after a minor revision.

General Questions

1. If the low SOC in urban forests are because of the increase of decomposition of SOM, the LF-OC in the surface layer should be more sensitive. Why there was no

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significant difference of LF-OC along the urbanization gradient? 2. There is debate on the temperature tolerance of recalcitrant and old soil organic matter decomposition (see the references below). So your explanation to the decrease of HF-OC along urbanization gradient is not solid. More robust evidences should be provided.

Reference

Giardina CP, Ryan MG (2000) Evidence that decomposition rates of organic carbon in mineral soil do not vary with temperature. *Nature* 404: 858–861.

Belay-Tedla A, Zhou XH, Su B, Wan SQ, Luo YQ (2009) Labile, recalcitrant, and microbial carbon and nitrogen pools of a tallgrass prairie soil in the US Great Plains subjected to experimental warming and clipping. *Soil Biology & Biochemistry* 41: 110–116.

Liu Q, Xu ZF, Wan CA, Xiong P, Tang Z, et al. (2010) Initial responses of soil CO₂ efflux and C, N pools to experimental warming in two contrasting forest ecosystems, Eastern Tibetan Plateau, China. *Plant and Soil* 336: 183–195.

Liski J, Ilvesniemi H, Makela A, Westman CJ (1999) CO₂ emissions from soil in response to climatic warming are overestimated - The decomposition of old soil organic matter is tolerant of temperature. *Ambio* 28: 171–174.

Fang CM, Smith P, Moncrieff JB, Smith JU (2005) Similar response of labile and resistant soil organic matter pools to changes in temperature. *Nature* 433: 57–59.

Specific Comments

P11338, Fig 2. “Distace” should be “distance”

Fig 3. Repeated the results of Table 2. I suggest moving Table 2 to affiliation.

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BGD

10, C5073–C5074, 2013

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