**We appreciate the referee's valuable comments on our work. Our responses to the specific comments are given below.**

**Responses to the comments of Referee#3:**

*Comment 1*: Page 30784 (lines 20-21): The phrase 'similar to a typical range of marine sources... (Miyazaki et al., 2011)' should be more clearly expressed. Does this value -20 to -22 per mille represent the $\delta^{13}C_{WSOC}$ or the isotopic ratio of all water soluble compounds, including inorganics (in the chemical analysis part of Miyazaki et al. (2011) no acidification of the samples is described). In the latter case, the comparison needs some more discussion.

***Reply 1*: The values represent the isotope ratios of total carbon (TC) with a negligible amount of elemental carbon (EC). Based on the referee's comment, we have modified the statement as follows:**
**"…, similar to a typical $\delta^{13}C$ range of OC in seawater and in marine aerosols (−20‰ to −22‰) (Turekian et al., 2003; Miyazaki et al., 2011)."**

*Comment 2*: Page 30784 (lines 26-27): Sentence 'However, reported ... (Rudolph et al., 2003)' should be rephrased. The 'processes' should be separately commented (formation and loss processes of WSOC, partitioning of WSOC to aerosol particles, see Fisseha et al. 2009). Is the reference Rudolph et al. 2003 the best one for this discussion on $\delta^{13}C_{WSOC}$, at all?

***Reply 2*: Based on the comment, we have added more references to the discussion on $\delta^{13}C_{WSOC}$ in the revised manuscript:**
**"Note that an effect of some minor isotopic fractionation on $\delta^{13}C_{WSOC}$ cannot be ruled out a priori. Namely, this process may occur during oxidation of VOCs and partitioning of WSOC to the aerosol phase (Fisseha et al., 2009). However, reported isotopic effects on $\delta^{13}C$ during aerosol formation and reactions relevant to $\delta^{13}C_{WSOC}$ are on the order of 0–2‰ (e.g., Rudolph et al., 2003; Widory, 2006; Fisseha et al., 2009), …"**

*Comment 3*: Figure 5: The authors should consider renouncing to the lines connecting the measurements in 2 and 15m height. This gives the impression that the profiles are linear (which is not necessary the case).

***Reply 3*: We agree that the vertical profiles are not necessarily linear. However, we believe that the lines in Figure 5 clarify the differences in concentrations and ratios**

**among the three seasons. Therefore, we chose to keep the lines, but have added a sentence to the figure caption to clarify this point:**
**"Note that the vertical profiles are not necessarily linear."**

*Comment 4*: The importance of MSA measurements should be shortly mentioned in the introduction.

***Reply 4*: As suggested, we mention the importance of MSA measurements in the revised Introduction.**

*Comment 5*: Page 30778 (line 4): 'larger' should be replaced by e.g. 'existing'. The N to W fractions are very small.

***Reply 5*: The word has been replaced by "existed" as suggested.**

Technical:
*Comment 6*: Page 30776 (line 4): Use 'contain' instead of 'constitute'.

***Reply 6*: The word has been changed as suggested.**

*Comment 7*: Page 30778 (line 15): NEE = net ecosystem exchange.

***Reply 7*: The words "net ecosystem exchange" have been added to the text.**

*Comment 8*: Page 30784 (line 18): Instead of 'In winter, a factor in which...' use 'In winter, factor5, in which...'

***Reply 8*: This has been changed as suggested.**

*Comment 9*: Generally, 'forest floor' should be used instead of 'canopy floor'.

***Reply 9*: As suggested, the term 'canopy floor' has been changed to 'forest floor.'**

**References**

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and carbonaceous aerosols using stable carbon isotopes, Atmos. Environ., 43, 431–437, 2009.

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Rudolph, J., Anderson, R. S., Czapiewski, K. V., Czuba, E., Ernst, D., Gillespie, T., Huang, L., Rigby, C., and Thompson, A. E.: The stable carbon isotope ratio of biogenic emissions of isoprene and the potential use of stable isotope ratio measurements to study photochemical processing of isoprene in the atmosphere, J. Atmos. Chem., 44, 39–55, 2003.

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