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Interactive comment on “Seasonal and inter annual variability of energy exchange above a boreal Scots pine forest” by S. Launiainen

Anonymous Referee #2

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Besides the many overview papers of carbon dioxide exchange studies at FLUXNET sites, the presented paper is one of only a few papers about the energy components in the atmosphere-vegetation system. An overview covering more than 10 years is of special interest because most of the other studies analyzed only certain specific aspects. The flux data were measured with the eddy-covariance method. This method is accepted and well described in the literature, but some more information is necessary for the interpretation of the data. The author thanks Mr. Keronen for his valuable work on quality control of eddy-covariance data; for the reader of the paper it would be important to know how he controlled the data – a reference or a description of some steps of the control would be helpful – and with which consequences for data selection etc. Furthermore, a footprint analysis of the measuring site would be very helpful for the interpretation. Probably the author has used some information (page 6448, line

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10-11), but some more information would be helpful, mainly about the influence of the nearby lake in the case of stable stratification. This could explain some of the results for the winter period. There is not much to do in this respect, because work has already been published (Göckede et al., 2008).

The Priestley-Taylor approach (Priestley and Taylor, 1972) is valid for the potential evaporation for water surfaces or saturated (wet grass) surfaces. Is a possible reason for the higher LE-values – in comparison to those obtained through this approach – that the author compared evapotranspiration data of a forest site with evaporation data of a saturated surface?

The numbering of Chapter 3 is confusing. I would begin with the “Climate conditions” and re-position Chapter 3.1 after Chapter 3.3 or even include this material into this chapter. The author should carefully check all the references. E.g. Foken et al. (2008) does not exist in the list of references and the last edition of the textbooks should be quoted (Monteith and Unsworth, 2008).

The Hyytiälä FLUXNET site is one of the most investigated sites. The data are part of the so-called La Thuile data set. Recently many papers were published to give a worldwide overview of FLUXNET results. Often the characteristics of the stations were classified, etc. Perhaps it would be interesting for the readers to how the Hyytiälä FLUXNET site can be classified in respect to other sites in accordance with these recent publications.

Reference:

Göckede, M. et al., 2008. Quality control of CarboEurope flux data – Part 1: Coupling footprint analyses with flux data quality assessment to evaluate sites in forest ecosystems. *Biogeoscience*, 5: 433-450.

Monteith, J.L. and Unsworth, M.H., 2008. Principles of environmental physics, 3rd edition. Elsevier, Academic Press, Amsterdam, Boston, 418 pp.

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Priestley, C.H.B. and Taylor, J.R., 1972. On the assessment of surface heat flux and evaporation using large-scale parameters. *Monthly Weather Review*, 100: 81-82.

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