Biogeosciences Discuss., 6, C1786–C1788, 2009
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Biogeosciences Discussions

Interactive comment on "Heat storage in forest biomass significantly improves energy balance closure particularly during stable conditions" *by* A. Lindroth et al.

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Received and published: 3 September 2009

A recent review by T. Foken (2008) has concluded that 'former assumptions that measuring errors or storage terms are the reason for the unclosed energy balance do not stand up'. But we agree with the authors of the present study that heat storage in forest biomass can indeed be a significant component of the energy balance in some ecosystems.

We would, however, like to remind the authors that we have recently found an analytical solution to heat conduction in tree trunks (Haverd et al., 2007). This analytical solution was compared to the method of Meesters and Vugts (1996), which is employed in the

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present study. It was shown that the Meesters and Vugts method can significantly underestimate the amplitude of the biomass heat storage flux. This is because the method neglects heat transfer by radiation, neither by long-wave energy exchange nor by insolation.

Another advantage of the analytical solution is that it is independent of the choice of measuring depths of the tree temperatures and independent of the chosen averaging method. Temperature measurements are often made at one or two depths per species and radius class leading to estimates of biomass heat storage that dependent on sensor depths and the averaging method (see e.g. McCaughey and Saxton, 1988; Moore and Fisch, 1986; Oliphant et al., 2004).

We also developed the analytical solution because it does not require the whole time series but can calculate iteratively from one time step to the next and is therefore applicable in Soil-Vegetation-Atmosphere Transfer (SVAT) models (Haverd et al., 2007).

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