

Interactive comment on “Inter-comparison of two land-surface schemes applied on different scales and their feedbacks while coupled with a regional climate model” by F. Zabel et al.

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Dear Referee #2,

Thanks for your comments. According to your major comments:

In order to clarify the methods of the study more clearly and to more clearly specify the goals of this paper, we revised the abstract, the introduction and the conclusions. Since the simulation setup obviously confused the reviewers, Figures 1 and 2 were revised within the included method section. The result section was also complemented with more substance, now also considering temporal differences of temperature, precipita-
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tion and evapotranspiration. Thus, we hope we could eliminate all previous deficits.

According to your other points:

Abstract:

The abstract has been revised in order to point out the scope of this paper more clearly. Your suggestions were incorporated in the new version of the abstract.

Abstract, line 20 (but also in the rest of the paper): As you suggested, we now only use the terms offline coupling and interactive coupling

Introduction:

Introduction, p 7093, line 26: Complementated with 'Project for Intercomparison of Land-surface Parameterization Schemes'

Introduction, p 7093/7094: We now only use the term 'land surface model'. Hence, the title was changed correspondingly.

Study area:

Study area, p 7096, line 15: 'Atlantic Ocean' was replaced as the 'North Sea'

Land surface schemes:

Land surface schemes, p 7097 and further: The formulations are corrected and made consistent in the text and in the formulations, the reference in the text are complemented.

Land surface schemes, p 7101, Eq. (7): $Dz_1 + dz_2$ is correct, since only the three rooted soil layers are considered here (see Chen and Dudhia 2001a)

Land surface schemes, p 7102, line 8: The Water vapor pressure is meant in that context. It was complimented in the text.

Coupling approaches:

Coupling approaches, p 7104, line 19/20: '...and vice versa' was complimented.

Results and discussion:

Results and discussion, p7108, lines 15-20: Fig. 10,11,12 demonstrate the impact of the soil water content (Fig. 10) on the PROMET transpiration since the lack of soil water reduces transpiration drastically in the late summer months each year (Fig. 11). Figure 12 could be left out but is shown since it proves that inhibition of transpiration is due to the soil water and not due to other reasons such as temperature or radiation effects.

Results and discussion, p7109/7110: We combined the two sections as you suggested and more clearly point out, that the feedbacks mutually affect the atmosphere and the land surface.

Figures: The figures are attached with a high resolution. Therefore, the legend should be readable now.

Figure 1: Figure 1 was replaced and in addition to the complemented introduction now includes a detailed description which hopefully helps to clearly explain the simulation setup of this paper.

Figure 4: The regional climate models are deleted in this figure.

Figures 11 and 12: New adequate time line is added.

Figures 14 and 15: Yes, it is scaled with SCALMET. This was complemented in the Figure description.

Figure 16 (now 20): The quantity plotted here, is the water stress function (Eq. 9) after Jarvis (1987), which is between 0 and 1 and mapped here as percentage values between 0 and 100.

Please also note the supplement to this comment:

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<http://www.hydrol-earth-syst-sci-discuss.net/8/C4442/2011/hessd-8-C4442-2011-supplement.pdf>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 7091, 2011.

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