

## ***Interactive comment on “Results from the implementation of the elastic viscous plastic sea ice rheology in HadCM3” by W. Connolley et al.***

**W. Connolley et al.**

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page 5: as stated in the last para of section 2.1, the ice-ocean flux becomes proportional to the ice fraction. The effects of changing side-area to volume ratios have not been investigated.

page 7, 2nd para: we believe that these improvements are due to the sea ice being able to respond directly to the windstress forcing. The statement "EVP allows..." is ambiguous then, since it is not clear is we mean the rheology or the windstress; we propose to alter this to "By including the wind stress directly, EVP allows...".

End para: the inclusion of a rheology prevents convergence of the ice to some degree, and hence tends to make the ice thinner (of course in theory this could be offset by the thermodynamics, but this does not seem to happen). We will add a brief note to this.

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Comment re developed to work with: perhaps it would be better to say that the overall simulation of HadCM3 has been developed and tuned within the context of the existing sea ice model. I cannot answer for exact details but matters such as the ice albedo and many other aspects of HadCM3 have been tuned, or allowed to stay, based on the interaction with the existing ice. We propose rephrasing this as "... as HadCM3 has been developed and tuned with the existing ice model".

page 8: We are reluctant to include additional figures here, especially as we have adopted referee 2's suggestion to add extra figures showing the "best" state in summer and its thickness.

End of section 5.2: it should be M\_5.

Top of page 9: We are not sure what this comment refers to.

Page 10: the sea ice does not see the polar island directly, it flows over it. However the ocean currents do see the pole and this inevitably affects the performance, as do problems with the atmospheric circulation. Ice thickness for the Arctic is displayed in figure 4, and will be shown for the optimised model too. But for the reasons already given, we prefer to concentrate on the Antarctic.

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Interactive comment on Ocean Sci. Discuss., 3, 777, 2006.

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