General comments:

This is an important and novel paper, well explained for the most part, and should be published with just a few changes to increase its clarity.

The finding that the growth rate is a U-shaped function of climate sensitivity is unexpected and should prompt other modellers to check if they also find this relationship.

The very large dependence of the SCC on equity weights is expected, and makes the choice of no equity weights for the base case a rather strange one. I would have thought the combination of average equity weights with a non-zero elasticity of marginal utility would be more defensible as a base case.

The 40% reduction in the SCC when CO2 fertilization is included is surprising. Is agriculture really such a large proportion of the total impacts? Or is there something else going on with the CO2 fertilization that carries over into other impacts sectors?

Detailed comments:

First part of footnote 3 just repeats footnote 1. Can be omitted.

p3. "The terminal period is 3000 to provide a proper time horizon for estimates with a low discount rate." Perhaps worth a phrase to acknowledge the huge uncertainty of going this far into the future.

p4. "with a best guess e-folding time of 66 years for a climate sensitivity of 3.0" This is a bit unclear; is the e-folding time different for other values of the climate sensitivity?

p4. "multiplying the global mean temperature by a fixed factor2 presumably means "multiplying the global mean temperature *rises* by a fixed factor". Should be changed. The next sentence needs similar revision.

p4. "The value of a statistical life is set to be 200 times the annual per capita income". Say whether this varies by region.

p4. "The value of emigration is set to be 3 times the per capita income (Tol 1995), the value of immigration is 40 per cent of the per capita income in the host region (Cline 1992)." This is ambiguous. Are both values negative? So if one person migrates from region A to region B, the total loss is 3xregion A income + 0.4xregion B income?

p5. "slightly higher emissions in the ten years following the year for which we compute the social cost of carbon." This needs some explanation. Why not just increase the emissions in the single year, particularly as your model allows you to do this?

p6. The equation which aggregates the SCC across regions needs better explanation. It seems to have adopted exactly the ad-hoc adjustment for inequality used in the PAGE2002 model, rather than the more defensible form, based on the utility of consumption, advocated in earlier work

by Anthoff. Perhaps they are identical for this special case of a marginal change in impacts. If so this should be stated or, better, demonstrated.

p7. "risk aversion". This is called either elasticity of marginal utility or inequity aversion in the equation definitions on p6. From the context, I suspect it is the former.

p7. Need to define what is meant by "US equity weights" and "African equity weights". I assume it is the identity of the ref region in equation 2.

p8. "Although some impact functions…" should be "Although in the base case some impact functions…".

p8. "FUND is the only integrated assessment model to include dynamic vulnerability". This is not true; the current version of the PAGE model, PAGE09, also has this feature.

p9. "In the linear model, this does not hold and the social costs of carbon fall." But this does not explain why the SCC is negative. There needs to be an explanation of this, as it is a surprising result at first glance.

p9. "fertilization effect. Figure 6" should be "fertilization effect. Figure 7"

p9. "However, the focus on the growth rate of the social cost of carbon and our estimate is similar to previous estimates." This sentence is not quite right. Perhaps "However, the focus of *this paper is* on the growth rate of the social cost of carbon and our estimate is similar to previous estimates."

The axes of all figures except 2, 3 and 5 need to be changed to a different, smaller, font; the horizontal axis labels of figs 1 and 8 need to be rotated.