

## ***Interactive comment on “Estimation of the climate feedback parameter by using radiative fluxes from CERES EBAF” by P. Björnbo***

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There may be a need for some additional information on the temperature anomalies used in the discussion article. Monthly temperature anomalies from HadCRUT3 were used without changing the reference period. As a consequence the temperature anomalies and the net radiative flux anomalies are based on different reference periods. Here it is shown that this did not influence the results and conclusions of the discussion article.

Due to the 13 months smoothing of the anomalies the results in the article are not sensitive to a change in reference period for the temperature anomalies. This was checked by recalculating the anomalies with respect to the reference period 2001 - 2011 that is the reference period used for the net radiative flux anomalies.

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The recalculation of the anomalies was based on Eqs. (1)-(5) where  $A_{ik}^{(j)}$  is the temperature anomaly for month  $i$  with  $i = 1, \dots, 12$ , for year  $k$  with  $k = 2000, \dots, 2011$  and with respect to the two reference periods  $j = 1, 2$ . The temperature is denoted  $T_{ik}$  while  $T_{av,i}^{(j)}$  is the average temperature for month  $i$  with respect to the reference period  $j$ .

$$A_{ik}^{(1)} = T_{ik} - T_{av,i}^{(1)} \quad (1)$$

$$A_{ik}^{(2)} = T_{ik} - T_{av,i}^{(2)} \quad (2)$$

$$A_{av,i}^{(1)(2)} = T_{av,i}^{(2)} - T_{av,i}^{(1)} \quad (3)$$

$$A_{ik}^{(1)} - A_{ik}^{(2)} = T_{av,i}^{(2)} - T_{av,i}^{(1)} \quad (4)$$

$$A_{ik}^{(2)} = A_{ik}^{(1)} - A_{av,i}^{(1)(2)} \quad (5)$$

The anomalies with respect to the second reference period may be calculated by Eq. (2) after retrieving the values of the temperature  $T_{ik}$ . However Eqs. (3)-(5) prove that without the temperature values we may calculate anomalies with respect to the second reference period from the anomalies with respect to the original reference period. In those equations  $A_{av,i}^{(1)(2)}$  is the average for month  $i$  of the original anomalies with respect to the second reference period.

Equation (5) is the equation for calculating anomalies from anomalies. This equation is derived by combining Eqs. (3) and (4). Equation (4) is derived by combining Eq. (1) and (2). Equation (3) is derived by taking the average for month  $i$  with respect to the second reference period of both sides of Eq. (1). The first term in the right hand side of Eq. (3) then is obviously the average of the temperature with respect to the second reference period. The second term in Eq. (1) is a constant and preserved when the temperatures for month  $i$  are averaged.

In Fig. 1 the smoothed time series of the temperature anomalies with respect to the

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original and with respect to the second reference period are shown. The blue original curve is the same as seen in Fig. 1 in the discussion article. The red curve shows the smoothed recalculated anomalies. The recalculated anomalies with respect to the reference period 2001-2011 were obtained from the original anomalies using Eq. (5) and after that smoothed by calculating the running 13 months averages. The two curves are almost identical and only their positions in the y-direction are different. Since only changes in temperature anomalies are compared with changes in radiative flux anomalies that cannot essentially affect the results and conclusions obtained in the article.

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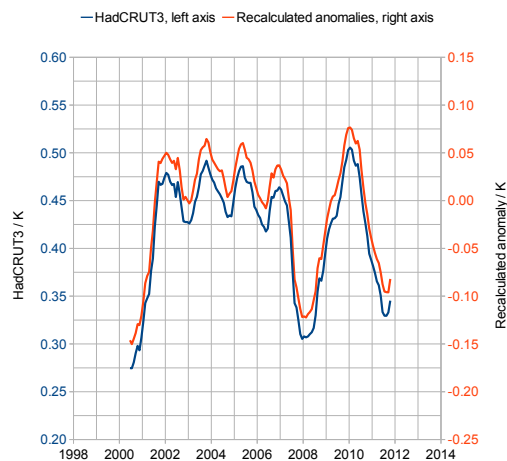


Fig. 1. Thirteen months centered running averages of temperature anomalies.

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