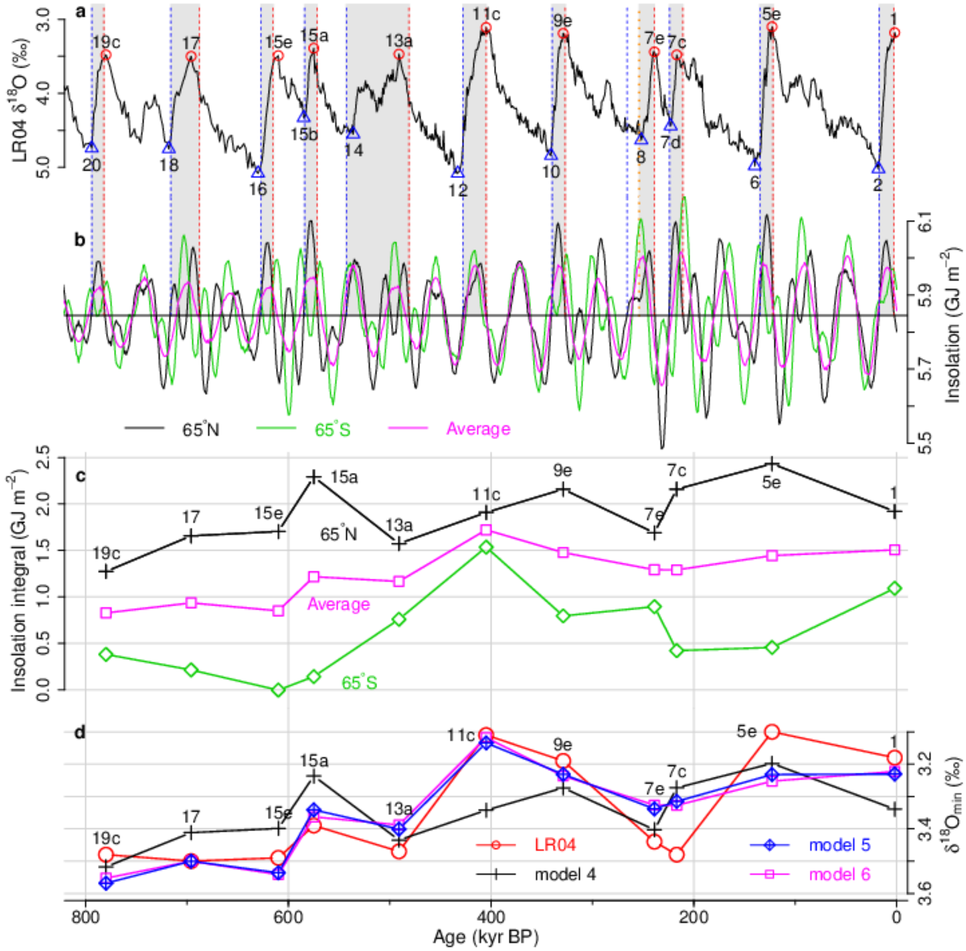

Figure S1: Modelling interglacial intensities without $\delta^{18}\mathrm{O}_{\mathrm{max}}$ term. (a) LR04 $\delta^{18}\mathrm{O}$. The red circles indicate the minima of $\delta^{18}\mathrm{O}$ ($\delta^{18}\mathrm{O}_{\mathrm{min}}$) at each interglacial, and the blue triangles the maxima ($\delta^{18}\mathrm{O}_{\mathrm{max}}$) at glacials. See below for the grey strips and the dashed lines. (b) Caloric summer half-year insolation at 65°N (F_N, black) and 65°S (F_S, green). The average of the two (magenta) is also shown. The blue dashed lines show timings t_s at which the caloric summer half-year insolation at 65°N exceeds average 5.845 GJ m^{-2} (black horizontal line) and the red dashed lines show timings t_e at which the insolation falls back below the average. Each termination starts roughly around t_s, and it is completed around t_e. Exceptionally termination III starts after the local insolation minimum at 254 kyr BP (orange dotted line), responding to the second rise in the insolation. The grey strips show the termination intervals $[t_s, t_e]$ based on the insolation curve. (c) Integral of the caloric summer insolation anomaly between t_s and t_e at 65°N, I_N (black cross), the integral at 65°S for the same period, I_S (green diamond), and the average $I_{AV} = \frac{1}{2}(I_N + I_S)$ (magenta square). (d) Predictions by linear regression models with explanatory variables in (c): Model 4 with I_N (black cross); model 5 with both I_N and I_S with their own coefficients (blue diamond with cross); model 6 with I_{AV} (magenta squares). See Table S1 for details.

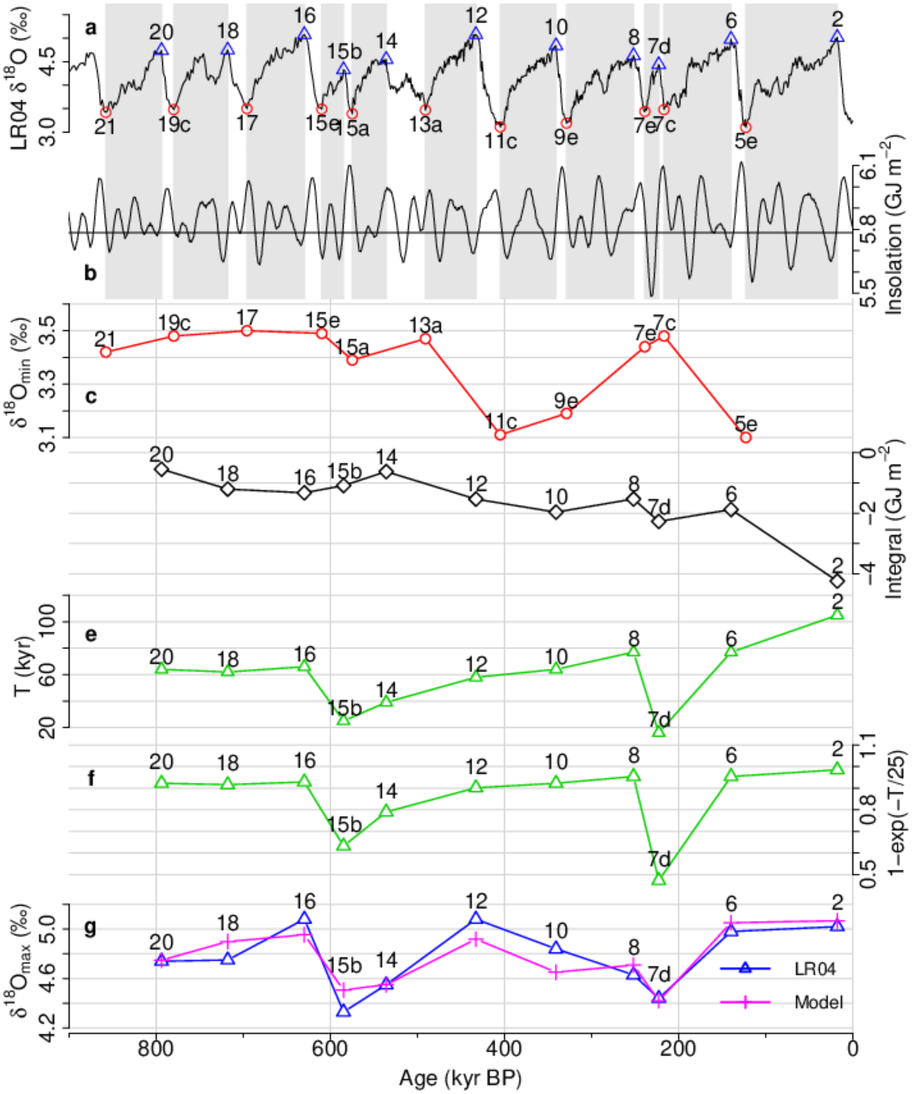

Figure S2: Same as Fig. 4 but with the integral of the insolation below a threshold 5.785 GJ m^{-2} instead of the total time used in Fig. 4. (a) LR04 δ^{18}O. The red circles indicate the minimum $\delta^{18}\mathrm{O}_{\mathrm{min}}$ at each interglacial, and the blue triangles the maxima $\delta^{18}\mathrm{O}_{\mathrm{max}}$ at glacials. The time intervals between them are shaded. Note that the data are plotted inversely to Fig. 2, with glacial maxima above interglacial minima. (b) Caloric summer insolation at 65°N. The grey shading is the same as in (a). (c) $\delta^{18}\mathrm{O}_{\mathrm{min}}$ for each interglacial. (d) Integral of the caloric summer insolation below a threshold 5.785 GJ m^{-2} between the interglacial peak and the glacial peak: $\sum_{\{t|F_N(t)<5.785\}}(F_N(t) - 5.785)$. (e) Time span T between the interglacial peak and the glacial peak. (f) $1 - e^{-T/25}$. (g) Prediction of $\delta^{18}\mathrm{O}_{\mathrm{max}}$ from the linear regression relation with explanatory variables in (d) and (f) (R=0.887).

	β_0	β_2	β_3	p	R (correlation)	R^2	BIC
Model 4	3.87***	-0.276	$\equiv 0$	0.062	0.58	0.34	-6.7
Model 5	4.00***	-0.275*	-0.225*	0.006	0.85	0.72	-13.8
Model 6	3.96***	-0.487**	$\equiv 0$	0.001	0.84	0.61	-15.9

Table S1: Coefficients and statistics of the regression models without $\delta^{18}O_{max}$ term (corresponding to Fig. S1). Model 4 ($\delta^{18}O_{min} = \beta_0 + \beta_2 I_N$), Model 5 ($\delta^{18}O_{min} = \beta_0 + \beta_2 I_N + \beta_3 I_S$), and Model 6 ($\delta^{18}O_{min} = \beta_0 + \beta_1 \delta^{18}O_{max} + \beta_2 I_{AV}$) are obtained from models 1, 2, and 3, respectively, by removing $\delta^{18}O_{max}$ term. The overall F-test provides a p-value less than 0.05 in each model, which rejects the null hypothesis that none of the variables in the model are significant. The asterisks indicate the significance of each coefficient: * for $p \in (0.01, 0.05]$, ** for $p \in (0.001, 0.05]$, and * for $p \in [0, 0.001]$.**