Supporting Information for " Quantifying Earth's radiogenic heat budget"

1. Full electron antineutrino flux equation

Table S1 explains the meaning of each symbol and its units.

$$\frac{dN(E_{\bar{\upsilon}_e},\vec{r})}{d(E_{\bar{\upsilon}_e})} = \epsilon \, \frac{N_A \lambda}{\mu} \, \sigma_P \, (E_{\upsilon_e}) \, \frac{dn(E_{\bar{\upsilon}_e})}{d(E_{\bar{\upsilon}_e})} \int_{\oplus} P_{ee} \, (E_{\bar{\upsilon}_e}, |\vec{r} - \vec{r\prime}|) d\vec{r\prime} \, \frac{a(\vec{r})\rho(\vec{r\prime})}{4\pi |\vec{r} \, - \, \vec{r\prime}|^2} \tag{1}$$

Table 1: Heat production and geoneutrino flux results

Symbol	Description	Units
$\frac{dN(E_{\bar{\upsilon}_e},\vec{r})}{d(E_{\bar{\upsilon}_e})}$	$\bar{\nu}_e$ detection spectrum	$\bar{\nu}_e$
ϵ	10^{32} protons x 3.154 x 10^7s x 100%*	$proton \times s$
N_A	Avogadro's number	$\frac{atom}{mol}$
λ	Decay constant	$\frac{decay}{s \times atom}$
μ	Atomic mass	$\frac{kg}{mol}$
$\sigma_P \, (E_{\upsilon_e})$	$\bar{\nu}_e$ cross-section (function of $E_{\bar{\upsilon_e}}$)	$\frac{m^2}{proton}$
$\frac{dn(E_{\bar{\upsilon}_e})}{d(E_{\bar{\upsilon}_e})}$	$\bar{\nu}_e$ emission spectrum	$\frac{\bar{\nu}_e}{decay}$
$P_{ee} \, (E_{\bar{\upsilon}_e}, \lvert\vec{r} \, - \, \vec{r\prime}\rvert)$	Oscillation probability (function of $E_{\bar{\upsilon}_e}$)	unitless
$a(\vec{r})$	Concentration of radionuclide in cell	$\frac{kg}{kg}$
$\rho(\vec{r\prime})$	Density of rock in cell	$\frac{kg}{m^3}$
$\lvert\vec{r} \, - \, \vec{r\prime}\rvert^2$	Distance from cell to detector	m

*detector size and efficiency normalization factor

2. Heat production from K, Th, and U decay

Table 2: Radionuclide heat production

Radionuclide	Mole Fraction (%)	λ (a^{-1})	Q(MeV)	Q(pJ)
^{232}Th	100	4.916 x 10^{-11}	42.646	6.8326
^{235}U	0.72049	9.8531 x 10^{-10}	46.397	7.4336
^{238}U	99.2740	1.5513 x 10^{-10}	51.694	8.2823
^{40}K	0.01167	5.491 x 10^{-10}*	1.331*	2.132*

*Total from all ^{40}K decay modes