Figure S1. (a) Steady-state temperature field at 100 km depth predicted by the 3-D convection code for a plume with buoyancy flux $B = 2340 \text{ kg s}^{-1}$ and maximum excess temperature $\Delta T_{\text{max}} = 200 \text{ K}$ in a fluid with diffusion creep ($n = 1$) rheology with $E = 400 \text{ kJ mol}^{-1}$ and $V = 6.1 \times 10^{-6} \text{ m}^3 \text{ mol}^{-1}$. The horizontal resolution of the numerical grid is $\Delta x = \Delta y = 9 \text{ km}$, and the vertical resolution is variable with a minimum value $\Delta z = 2 \text{ km}$. The horizontal purple and dark blue striations are small-scale convective instabilities of the lowermost lithosphere above the plume head. (b) Black line: isostatic topography $S_{\text{iso}}$ (17) on the central axis $y = 0$ predicted by the 3-D code as a function of $x - x_0$ with $x_0 = 163 \text{ km}$. Red line: power-law decay (4) with $n = 1$ that best fits $S_{\text{iso}}$. Logarithmic scales are used for both axes.
Figure S2. Same as Figure S1, but for a dislocation creep rheology \((n = 3.5)\). The virtual hotspot position is \(x_0 = 47\) km. Because the best-fitting power law decay (4) with \(n = 3.5\) is nearly indistinguishable from \(S_{iso}\), we show instead a line with the predicted slope (-0.08) offset for clarity (red). For comparison, the blue line with slope -0.2 shows the predicted rate of decay for diffusion creep rheology \((n = 1)\).
Figure S3: Same as Fig. 3, but for $n = 4.7$. 