Supplementary material for ‘Links between large volcanic eruptions, basal mantle structures, and mantle plumes’

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Supplementary Video 1 | Evolution of radial heat advection, model plume conduits, and large volcanic eruptions. J18[17] eruptions (green discs), EY17[19] LIPs (yellow triangles) and D16[5] LIPs (magenta squares) and C4 radial heat advection and model plume conduit centroid locations (white disks). The video advances in 20 Myr increments from 300 Ma.

Supplementary Video 2 | Evolution of model BLOBS and plume conduits in the African hemisphere. BLOBS 310 K hotter than ambient mantle from 0 km to 2867 km depths, and model plume conduits for $J = 80$ K m yr^{-1} (both coloured by depth in warm tones, warmer being deeper). The video advances in 20 Myr increments from 300 Ma. Global coastlines reconstructed (transparent grey polygons), and J18[17] reconstructed volcanic eruption centroids (green triangles with black border), both using the tectonic reconstruction from ref. 23 in the no-net-rotation frame of reference.

Supplementary Video 3 | Evolution of model BLOBS and plume conduits in the Pacific hemisphere. BLOBS 310 K hotter than ambient mantle from 0 km to 2867 km depths, and model plume conduits for $J = 80$ K m yr^{-1} (both coloured by depth in warm tones, warmer being deeper). The video advances in 20 Myr increments from 300 Ma. Global coastlines reconstructed (transparent grey polygons), and J18[17] reconstructed volcanic eruption centroids (green triangles with black border), both using the tectonic reconstruction from ref. 23 in the no-net-rotation frame of reference.

Supplementary Video 4 | Evolution of spatial relationships between BLOBS, plume conduits and large volcanic eruptions. a, Angular distance to mobile C4 BLOBS, with C4 mantle plume conduit centroids shown as white discs, J18[17] eruptions as green discs, EY17[19] LIPs as yellow triangles and D16[5] LIPs as magenta squares. The video advances in 20 Myr increments from 300 Ma to present.

Supplementary Video 5 | Model plumes, large volcanic eruptions and LIPs. Angular distance to C4 plume conduit centroid locations with J18[17] eruptions shown as green discs, EY17[19] LIPs as yellow triangles and D16[5] LIPs as magenta squares locations and. The video advances in 20 Myr increments from 300 Ma to present.

Supplementary Video 6 | Evolution of spatial relationships between LLSVPs and large volcanic eruptions. Angular distance to static Savani[21] (T1) LLSVPs with J18[17] eruptions shown as green discs, EY17[19] LIPs as yellow triangles and D16[5] LIPs as magenta squares locations and. The video advances in 20 Myr increments from 300 Ma to present.

Supplementary Video 7 | Evolution of spatial relationships between C1 BLOBS, J18 large volcanic eruptions and uniform random locations. C1 BLOBS interiors are in dark grey, and outlines represented as a solid black line. J18[17] eruptions in database J18 from 300 Ma reconstructed above the exterior of LLSVPs are shown as green discs, and uniform random locations above LLSVPs exteriors from one distribution with the same number of points as database J18 overall are shown as red discs. The video advances in 20 Myr increments from 300 Ma.

Supplementary Video 8 | Evolution of spatial relationships between C4 BLOBS, J18 large volcanic eruptions and uniform random locations. C4 BLOBS interiors are in dark grey, and edges represented as a solid black line. J18[17] eruptions in database J18 from 300 Ma reconstructed above the exterior of LLSVPs are shown as green discs, and uniform random locations above LLSVPs exteriors from one distribution with the same number of points as database J18 overall are shown as red discs. The video advances in 20 Myr increments from 300 Ma.

Supplementary Video 9 | Evolution of spatial relationships between C6 BLOBS, J18 large volcanic eruptions and uniform random locations. C6 BLOBS interiors are in dark grey, and edges represented as a solid black line. J18[17] eruptions in database J18 from 300 Ma reconstructed above the exterior of LLSVPs are shown as green discs, and uniform random locations above LLSVPs exteriors from one distribution with the same number of points as database J18 overall are shown as red discs. The video advances in 20 Myr increments from 300 Ma.

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