

Gale

Gale Animations

In the two models offered below, the crust has a visco-plastic rheology, while the mantle is purely viscous. The viscosities are the same for the crust and mantle, and are temperature dependent. In these models, the temperature is set at an initial value and left there. There is no temperature evolution in either model. All boundaries have zero traction and are impermeable. Both of the models were run on CITerra, the 4096 core machine located in the Division of Geological and Planetary Sciences at Caltech, using Gale 1.2.1.

[2D Model of Plateau Under Extension](#). The 2D model covers a region 1000 km x 100 km with a resolution of 2048x256 (about 0.5 km/grid point). The crust is 32 km thick at the edges, thickening to about 50 km in the center to keep everything isostatically compensated. The right side is pulled at 1 cm/year. The model was run with 512 processors and used a direct solver (Mumps).



[3D Extension Model with Realistic Topography](#). The 3D model covers a region 1000km x 1000km x 100 km with a resolution of 128x128x16 (about 8 km/grid point). The crust is 32 km thick everywhere, with topography from a part of the Tibetan plateau just layered on. The north (right side) is pulled at 1 cm/year. The model was run with 128 processors and used an iterative solver (GMRES). Because we used an iterative solver, we had to modify the cohesion so that it does not soften as strongly.

