

Geophysics 150: Home set due Nov. 29, 2000

1. The Tibet plateau is 5 km above sealevel. Assume that the crustal root has a density of 3.0 gm/cc and that the mantle density is 3.3 gm/cc. A reference section at sealevel has crust 35 km thick.

a. Find the thickness of the crust under Tibet assuming isostasy.

b. The material actually exposed to erosion at the surface has a density of 2.6 g/cc. How much material needs to be eroded to reduce the elevation of the plateau to sealevel.

c. At the edge of the plateau erosion occurs in deep valleys and the peak tops do not erode. What is the elevation once the valleys have eroded to sealevel. (Hint: note that the effective density of the material erodes is 2.6 g/cc/2.) Can 9 km peaks be produced in this way.

