Finally, deep ocean trenches stand out as narrow, distinct, arcuate to linear bands of very high slope (0.3°–2.0°) which usually separate broad regions of seafloor with differing slope expression. The steepest regional slopes, however, do not correlate with the deepest trenches: the Philippine, Japan, and Kurile subduction zones display the highest regional slopes (approximately 2.0°), whereas maximum regional slope values associated with the deeper Mariana and Tonga-Kermadec trenches are between 1.0° and 1.5°. Because narrow features are undersampled at this scale, slope characteristics are strongly influenced by the width of the subduction zone as well as the depth of the trench.

Continental Interiors and Mountain Ranges

The stable continental interiors, comprising Precambrian shields and the associated platform sediments, display broad expanses of flat-lying surfaces; on the global scale these regions appear smoother and lower in slope than the oceanic abyssal plains. This difference probably reflects the significance of erosion as a planation process above sea level, as well as the great age of continents relative to the ocean floor. Folded mountain belts display a wide range of slope magnitudes corresponding, primarily, to the age of the orogeny: Regions of Paleozoic mountain building, such as the Appalachians along the eastern margin of North America, have slopes generally less than about 0.2°. Mesozoic to Recent mountain belts, such as the Andes and the Rocky Mountains, have characteristic regional slopes of 0.1° to 0.8°. In Plate 1, top, the Tibetan Plateau, just north of the Indian subcontinent, is enclosed by a bright ring of high regional slope (0.5°–1.3°). Lower regional slopes (0.2°–0.3°) typify the interior of the plateau and a distinct asymmetry to the slopes of the plateau margin is apparent. The southern margin (the Himalayan Front) is the site of major thrusting and suturing associated with the collision of India with Eurasia and yields regional slope values up to 1.3°. In contrast, the margin to the north appears to be related to the northward flow of weak Tibetan crust and upper mantle in response to continued convergence [*Molnar and Tapponnier*, 1978] and regional slope values (0.8° maximum) are significantly lower. Thus even at 3° by 3° resolution, regional slope variations can be distinguished which reflect rheological and structural heterogeneity within a major physiographic province.

Continental Margins

The continental margins are expressed as continuous regions of very high slope surrounding the major land masses on earth. In general, slopes associated with active continental margins appear steeper than those associated with passive margins (Figure 1). An important exception to this generality is observed in the southern and eastern continental margins of Australia which exhibit slopes as great as 1.4°. Active margins, particularly the Peru-Chile and the Aleutian subduction zones, include regions displaying the steepest regional slopes observed at this scale (2.4°). More typically, however, active margins are similar in slope magnitude to oceanic subduction zones but broader and more continuous.

The high regional slope values characteristic of earth's continental margins are primarily due to the steep gradients expressed by continental slopes (approximately 4° [*Heezen et al.*, 1959]; 2°–6° [*National Research Council*, 1979]). However, as continental slopes are usually only 20–100 km wide, a variable component of the surrounding terrain is averaged into the regional slope value when calculated over regions averaging about 300 km in width. For passive margins this component would be associated with the continental shelf and rise, both of which have topographic gradients much lower than the continental slope. For active margins, such as western South America, the occurrence of adjacent trench topography and, in some cases, coastal mountain ranges provides additional components of relief which serve to increase the calculated regional slope significantly over that which is characteristic of passive margins. The anomalously steep regional slopes associated with the (passive) eastern margin of Australia may be influenced by the Great Dividing Range, located on the east coast and containing the highest elevations found on the Australian continent [*Ollier*, 1982, and references therein]. Large regional slope values for the southern margin, however, appear to reflect the unusually steep gradient (6°–8°) [*Williams and Corliss*, 1982]) of the continental slope associated with this passive margin. The disparity in gradient between the steeper continental slopes found here and those of the North Atlantic passive margins (Plate 1, top) could be an expression of different degrees of thermal and depositional evolution related to the relatively recent (Paleocene) separation of Australia from Antarctica [*Williams and Corliss*, 1982] compared to the Triassic-Jurassic opening of the North Atlantic [*Heirtzler et al.*, 1968; *Dietz and Holden*, 1970].

REGIONAL SLOPE CHARACTERISTICS OF VENUS

Plains and Related Features

In contrast to the vast expanses of uninterrupted plains which typify the continental interiors and oceanic aybssal plains on earth, the extensive lowlands and upland rolling plains provinces of Venus are marked by numerous closely spaced features with regional slopes generally ranging between 0.1° and 0.2°, values which are significantly steeper than those characteristic of terrestrial plains. In terms of distribution, size, and regional slope magnitude these features most closely resemble the flanks of eroded mountain belts such as the Appalachians or the Yablonovgy-Stanovoy Ranges of eastern Asia (45°–60°N; 100°–150°E). Additionally, on earth, some (faster-spreading) mid-ocean ridge crests (Figure 1) and a variety of features within the volcanically and tectonically active portions of the ocean floor (e.g., the western Pacific and Indian oceans) are similar in regional slope magnitude to the Venusian features; however, the distribution and morphology of features within these regions are distinctly different from those of the Venus plains. Within the plains of Venus the 0.1°–0.2° features form numerous circular and linear systems on a variety of scales.

Circular features. Circular, elliptical, and a variety of irregular enclosed regional slope features are distributed throughout the plains provinces as shown in Figure 2*b*. These features display a range of regional slope characteristics but must typically occur as flat zones (0.0°–0.1° slope) bounded by ringlike margins sloping at about 0.1°–0.3°. Although some larger features mark the flanks of circular basins (e.g., Atalanta Planitia), most are domical features in the PV altimetry. They range in diameter from approximately 200 km to over 2000 km, and many are similar in size and regional slope characteristics to some terrestrial oceanic plateaus such as the Ontong-Java Plateau and the Bermuda Rise [*Ben-Avraham et al.*, 1981]. The smaller circular features may be the topographic expression of structures revealed in the Venera 15–16 radar