



Off-axis volcanic ridges on the flanks of the Pacific-Antarctic Ridge

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Numerous structures are revealed as gravity highs on the western flank of the Pacific-Antarctic ridge between 40°S and 55°S by the gravity grids derived from satellite altimetry measurements. We analyze some of these large off-axis volcanic structures mapped and dredged during the Pacantarctic2 cruise. Two of them form ridges on either side of the Menard transform fault (TF) near 50°S, and other ridges are oriented E-W near 42°S. South of the Menard TF, the off-axis volcanoes show either conical shapes with a summit caldera, and low backscattering, or elongated structures associated to narrow, EW-trending volcanic ridges, some of them showing strong backscattering on the EM12 imagery. All volcanoes show calderas opened to the east. The volcanoes closest to the axis show the strongest EM12 backscattering. K/Ar dating of samples dredged on these structures reveal a contrast of up to 3 m.y between the volcanoes and the underlying crust. North of the Menard TF, the volcanoes are elongated and linked by N100 to EW-trending narrow ridges. Two EW-trending ridges have been surveyed near 42°S. One ridge, from 111°40'W to 112°30'W at 41°55'S, appears to be very linear and narrow, and probably did not form by the coalescence of individual volcanoes. Near 41°15'S, a ridge is composed of elongated volcanoes linked by volcanic ridges. All volcanic ridges appear to have formed on lithosphere younger than 5 Ma. The volcanic activity, as suggested by the young K/Ar ages of some samples and by the strong backscatter in sonar images, appears to be limited to areas of seafloor younger than about 3 Ma. None of the ridges is aligned in the direction of plate motion. Most ridges are located on the traces of large ridge discontinuities. The

seamount chain south of Menard FZ is clearly cut by several normal faults, suggesting local extension. The major volcanic structures on the flanks of the Pacific-Antarctic ridge between 40°S and 55°S might result from intraplate deformation near the axis, following recent kinematic changes.