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Formation of rifts in central Tibet: Insight from P-wave radial anisotropy

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The strikes of rifts in western Tibet show NNW trending, whereas the rifts in eastern Tibet strike in the NNE direction. Seismic structure beneath these rifts can provide important information on their formation mechanism. In this work we study 3-D P-wave velocity structure and radial anisotropy using a large number of travel-time data recorded by the ANTILOPE and Hi-CLIMB portable seismic arrays deployed in central Tibet. To the west of the Pumuqu Xianza rift, a low-velocity zone with a positive radial anisotropy is revealed beneath the Lopu Kangri rift (∼85°E), which may reflect melt-filled cracks. A high-velocity zone with a negative radial anisotropy exists beneath the Pumuqu Xianza rift (∼88°E), which reflects lithospheric downwelling. The different patterns of the lithospheric mantle deformation may result in the regular strike orientations of rifts in central Tibet.