



Intermediate depth seismicity: reconciling contrasts between east and west Pacific slabs

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Slabs under south and central America (east Pacific slabs) tend to have shallower dips than slabs in the western Pacific. In addition, east Pacific slabs often deflect upwards beneath the upper plate. Flat slabs are an extreme example, but several more subtle regions of upwards deflection exist, including northern Chile and Guatemala. These morphological features have important implications for slab dynamics. One component of slab deformation rate is attributable to bending as material moves through regions of finite downdip curvature gradient. For east Pacific slabs, this geometric (or advective) slab bending induces a zone of extension in the cold upper half of the slab. This zone of extension commonly occurs within the intermediate depth range where slabs dehydrate. As such, the preponderance of down-dip tensional earthquake mechanisms in east Pacific slabs could be a result of slab bending rather than stretching, as is commonly assumed.