During the great 3 May 1887 Sonoran earthquake (surface rupture extent and length: 10.1 km, Mw = 7.5±0.3), an array of three north-south striking Basin-and-Range Province faults (from north to south, Pitáycachi, Teras, and Otates) slipped sequentially along the western margin of the Sierra Madre Occidental Plateau. This detailed field survey of the 1887 earthquake rupture zone along the Pitáycachi fault includes mapping the rupture scarp and measurements of surface deformation. The surface rupture along the western margin of the Sierra Madre has an en-echelon-downdip length of 41.0 km, which is characterized by a 6-W extension, perpendicular to the fault trace. The maximum surface offset is 487 cm and the mean offset 260 cm. In the north, the rupture terminates against a major cross fault, whereas in the south, a 2.5-km-wide unlithified right step-over separates the Pitáycachi from the Teras segment. The 1887 along-strike surface offsets are proportional to the one order-of-magnitude larger along-strike offsets of a distinct Pleistocene alluvial fan surface, which suggests that the 1887 rupture dimensions are characteristic for ruptures along the Pitáycachi fault.

Whereas the Teras and Otates segments have the typical 15–20 km length of normal fault segments, the Pitáycachi surface rupture shows a well-developed bipolar branching pattern suggesting that the rupture propagated bifurcationally along the fault, jumped across a step-over to the Teras fault and from there across a major relay zone to the Otates fault. The length of the propagated fault resulted from the lateral propagation of the rupture due to the unusual length of the fault; such that the first rupture of the Otates and Teras segments did not develop branches.

### Slip Vectors

- **Fault Plane**
  - Strike: 030°
  - Dip: 70°
  - Rake: 20°
  - Normal Kinematics
  - Moment magnitude 7.5

### En échelon Rupture Scarp Array

- **Map and vertical aerial photograph** showing in detail the major en-echelon rupture traces in the northern part of the Pitáycachi segment, south of Cañón de los Embudos, and related fault propagation.

### Rupture Branching

- **Map and vertical aerial photograph** showing the rupture lengths and slip ratios of the major individual 1887 rupture segments and related linear displacements. The white arrows represent the maximum slip directions across the mean slip.

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