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stress field in the Valley of Mexico from local seismicity

We performed a comprehensive analysis of the seismic activity in the Valley of Mexico using the records of the nearby seismic stations. We determine the focal mechanisms of earthquakes ($M > 2.5$) in the Mexico Basin from 2010 to 2024. Events were chosen with a high signal to noise ratio, i.e., raw P and S arrivals clear enough to be distinguished. Focal mechanisms were inverted using the ISOLA method, finding that most of the seismicity of the Valley of Mexico presents normal-type faulting. We grouped the resulting events according to their epicentral location into five families that we will call: a) Sierra de las Cruces (SC) b) Central area (C) c) Southeastern area (SE) d) Lake-bed area (LB) and e) Sierra Chichinautzin (CH). With these five event groups, we performed a local stress field analysis to detect variations that allow us to infer how these stresses affect the activation of previously mapped faults. Most activity occurs mainly in the western areas, along the Sierra de las Cruces and southeast of the Valley of Mexico, in Milpa Alta and Juchitepec zones. This result is significant because the activity in the center-west part represents a danger due to its shallow depth under highly populated areas.

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