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Volume 29, Number 1
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GPS estimate of relative motion between the Caribbean and South American plates, and geologic implications for Trinidad and Venezuela

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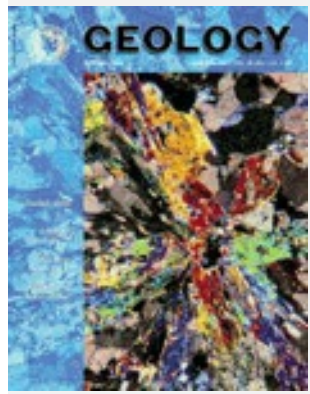
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Abstract

Global Positioning System (GPS) data from eight sites on the Caribbean plate and five sites on the South American plate were inverted to derive an angular velocity vector describing present-day relative plate motion. Both the Caribbean and South American velocity data fit rigid-plate models to within $\pm 1\text{--}2$ mm/yr, the GPS velocity uncertainty. The Caribbean plate moves approximately due east relative to South America at a rate of ~ 20 mm/yr along most of the plate boundary, significantly faster than the NUVEL-1A model prediction, but with similar azimuth. Pure wrenching is concentrated along the approximately east-striking, seismic, El Pilar fault in Venezuela. In contrast, transpression occurs along the 068° -trending Central Range (Warm Springs) fault in Trinidad, which is aseismic, possibly locked, and oblique to local plate motion.

GeoRef Subject

faults Lesser Antilles Antilles Caribbean region plate tectonics neotectonics South America Trinidad and Tobago tectonics Trinidad West Indies Venezuela

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velocity

Venezuela

West Indies

wrench faults

Warm Springs Fault

El Pilar Fault

NUVEL-1A model

Latitude & Longitude

N00°45'00" - N12°10'00", W73°15'00" - W59°55'00"

N10°01'60" - N10°50'60", W61°55'60" - W60°52'60"

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