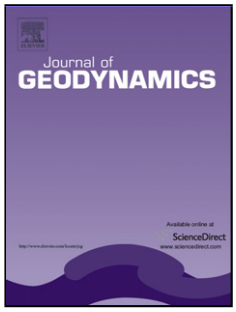

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Topography as a proxy for inter-plate coupling

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We have correlated mean topography, topographic slope and GPS derived strain rates along the active orogenic belts of South America (Ecuador and northern Peru segments).

We find that Ecuador and northern Peru segments are following well-defined power-law relation with distinct exponents of 3.76 and 3.10 respectively, which are consistent with the nonlinear deformation associated with dislocation-creep, which occurred at greater depth.

We propose that depth of dislocation-creep and distinct power-law exponents have first order control over mean topography.

We propose that topographic slope can be used as proxy for inter-plate coupling, even in the absence of geodetic data and could be considered as crucial fingerprint for an objective seismic hazard assessment.