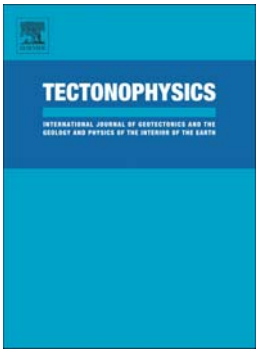

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Fault dip angle determination with the ${}_{j}\mathcal{R}_{i}$ criterion and coulomb stress changes associated with the 2015 Mw 7.9 Gorkha Nepal earthquake revealed by InSAR and GPS data

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ABSTRACT

Minimizing data misfit has been widely used in geodetic determination of fault dip angle, however, it ignores the contribution from data noise. Here, we use the ${}_{j}\mathcal{R}_{i}$ criterion, which takes into account both data misfit and the contribution from data noise, to determine dip angle. Synthetic tests show dip angle estimates with the ${}_{j}\mathcal{R}_{i}$ criterion are more accurate and robust than those with data misfit minimization. We applied this ${}_{j}\mathcal{R}_{i}$ criterion to the determination of the dip angle of the 2015 M_w 7.9 Gorkha Nepal earthquake using Interferometric Synthetic Aperture Radar (InSAR) and Global Positioning System (GPS) data. The results show that the event ruptured to the north of Kathmandu with a maximum slip value of 5.8 m and a dip angle of 9.5°. We also calculated the coulomb failure stress changes resolved onto the receiver