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Role of Faulting Styles on Controlling Aftershock Patterns

Using global earthquake catalogs, we resolve that on average most of the parameters of the Omori law are dependent on faulting styles. Strike slip events, have lower aftershocks rate and K-value than thrust and normal events, respectively. Within the ETAS model strong K- and rate values are driven by high branching ratio. Within the same framework, a relatively higher branching ratio for the thrust events also predicts the lower p-value we observe for thrust events as compared to strike slip and normal events, respectively. From the one hand the Anderson faulting theory predicts thrust faulting requires a somewhat larger stress context, in absolute magnitude, that does normal and strike-slip faulting. From the other hand within the framework of rate and state friction law a change in the stress heterogeneity patterns reproduce the p-value changes we observe. Second, we resolved on average, reverse faults have a smaller magnitude and distance from the mainshock to largest aftershock than strike-slip faults i.e. the Bath's law is impacted by the faulting style.

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