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Inferences on paleostress conditions along intraplate strike-slip fault systems from the analysis of consistent kinematical architectures. The case of north Victoria Land, Antarctica

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Intraplate strike-slip fault systems can accommodate tens to hundreds of kilometres of horizontal displacement between adjacent lithospheric blocks. They typically include almost straight sectors alternated with bends and offsets in individual segments, each of them consisting of complex arrays of anastomosing fault strands. The kinematics of the fault strands depends on their orientation with respect to the total stress field along principal displacement zones. The latter in turn results from the interplay between the kinematical stress field produced by fault motion, and the regional stress field. Strike-slip, transpressional and transtensional fault segments typically coexist along intraplate strike-slip fault systems. This may occur at different scales and may result in the development of very complex fault patterns. In many cases, large-offset faults are not preserved within strike-slip fault systems, due to the progression of the tectonic activity and to preferential erosion and sedimentation in highly fractured fault zones. Nevertheless, subsidiary faults are widespread in the damage zones of major fault strands. Detailed fieldwork on the three-dimensional architecture of subsidiary faults along continentally sized fault systems provides important information on the modalities of fault propagation and displacement accommodation, the role of fault re-activation, and on stress conditions along specific fault strands. However, the possible variability of dynamic and kinematical stress conditions along the fault traces and their along- and across-strike geometric irregularity implies that generalization of "local information" to constrain the state of stress along strike-slip fault systems may lead to biased inferences. Cumulative statistics of subsidiary fault datasets may provide a

useful analytical tool to constrain the kinematics and the total stress field orientation along strike-slip principal displacement zones by filtering the stress, geometric, and structural variability at the local scale. In this contribution we present the results of cumulative Gaussian statistics of subsidiary fault data collected from damage zones associated with the Cenozoic Lanterman and Priestley intraplate right-lateral strike-slip fault systems in north Victoria Land, Antarctica. Cumulative analysis of statistically significant fault types shows that 5 Gaussian peaks out of 7 in the Lanterman Fault and 5 out of 9 in the Priestley Fault have almost coincident azimuthal values. We define these Gaussian peak pairs as *consistent fault sets*, arranged in a *consistent kinematical architecture* that is compatible with the Cenozoic regional strike-slip environment. Angular and kinematical relationships among subsidiary fault sets within the consistent kinematical architecture provide constraints for the inference of the state of stress along the Lanterman and Priestley Faults.