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Supplementary Materials for

A case for historic joint rupture of the San Andreas and San Jacinto faults

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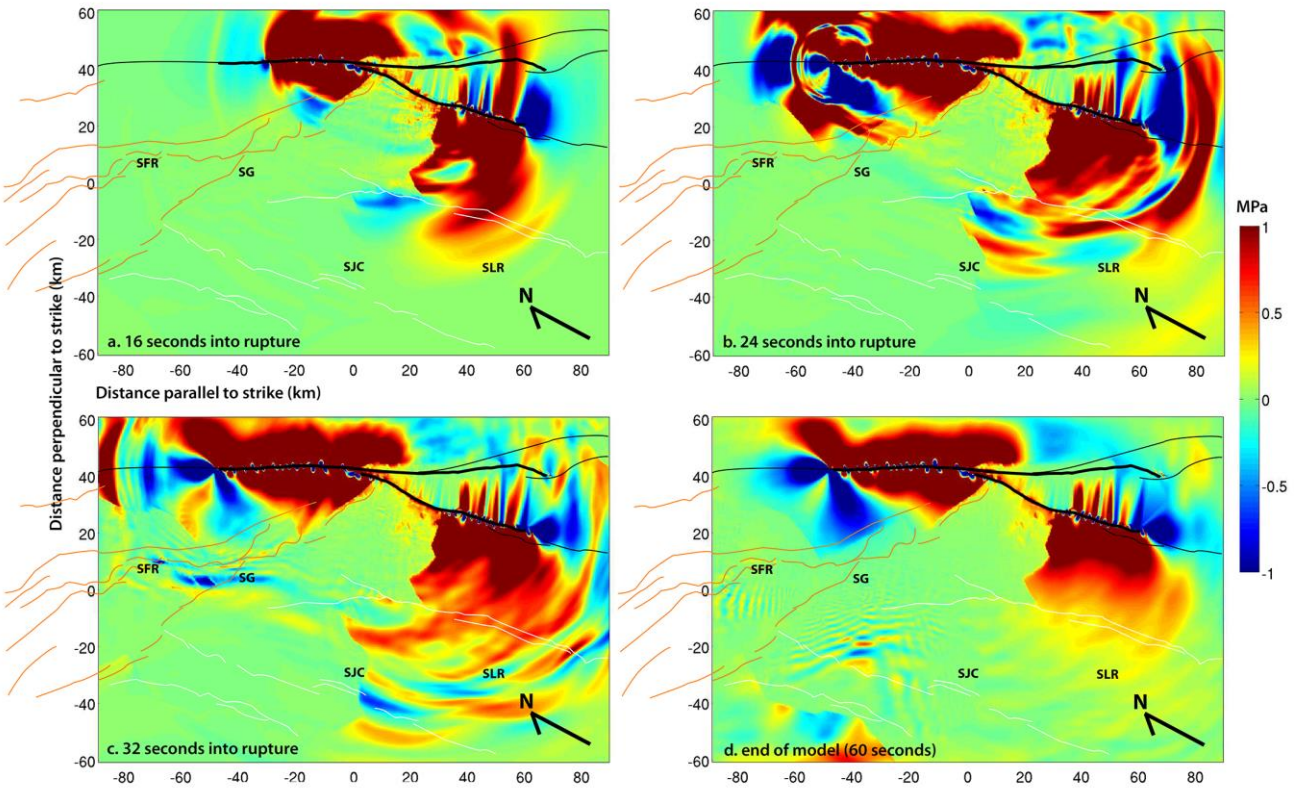

Fig. S1. Coulomb stress changes from a model rupture with nucleation on the SJF at Cajon Pass. Snapshots of Coulomb stress changes, as resolved onto N80E-striking left-reverse faults. The faults included in the model are marked by heavy black lines; the finer black lines represent the continuations of the SAF and SJF. The left-reverse faults of the Transverse Ranges are indicated by orange lines. Panel (a) shows bilateral rupture propagation along the SAF and SJF. In panels (b) and (c), rupture has reached the end of the modeled portion of both faults, radiating large stress increases to the NW of the SAF and SE of the SJF. Panel (d) shows the stress state at the end of the model.

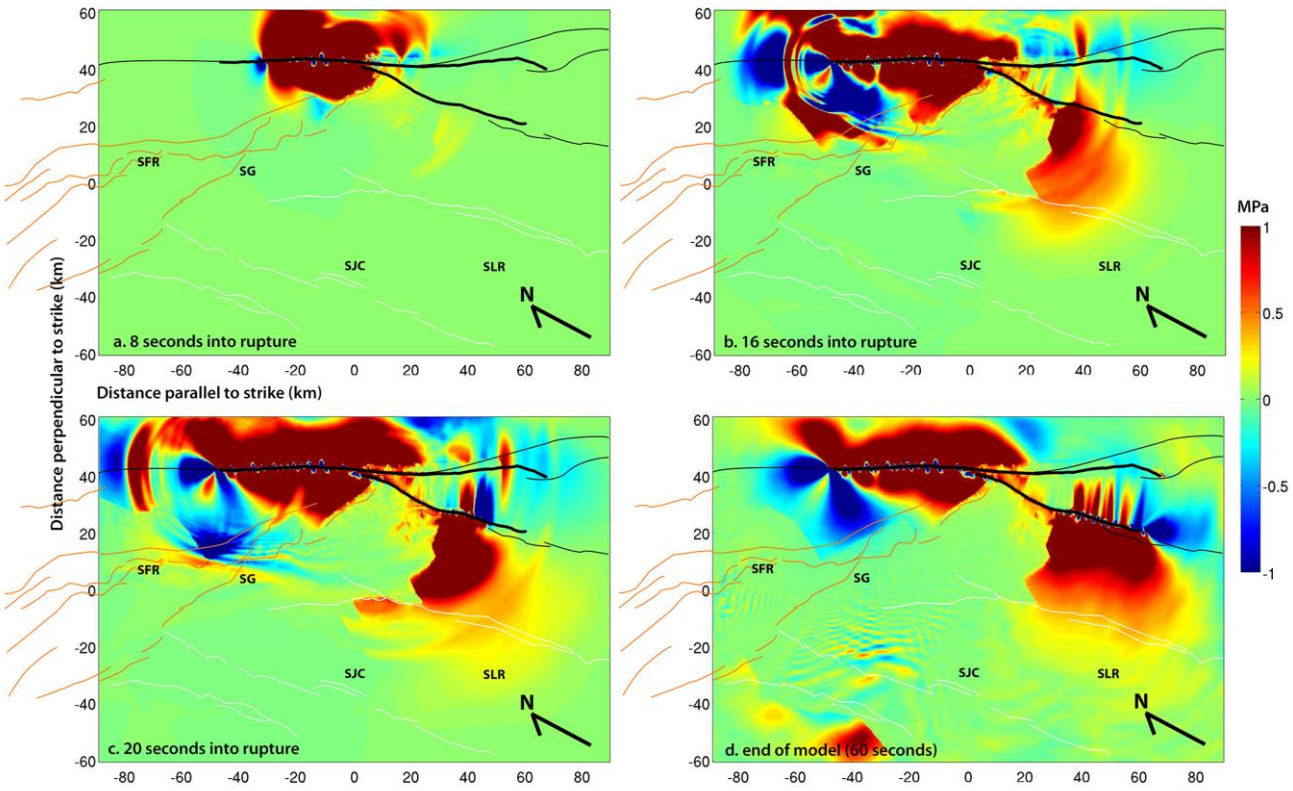

Fig. S2. Coulomb stress changes from a model rupture with nucleation on the SAF at Cajon Pass. Snapshots of Coulomb stress changes, as resolved onto N80E-striking left-reverse faults. The faults included in the model are marked by heavy black lines; the finer black lines represent the continuations of the SAF and SJF. The left-reverse faults of the Transverse Ranges are indicated by orange lines. In panel (a), rupture propagates NW along the SAF but has not yet jumped to the SJF. By panel (b), rupture has reached the NW end of the modeled portion of the SAF and propagates SE along the SJF, producing large stress increases along both rupture fronts, which persist after rupture has reached the end of both faults in panel (c). Panel (d) shows the stress state at the end of the model.

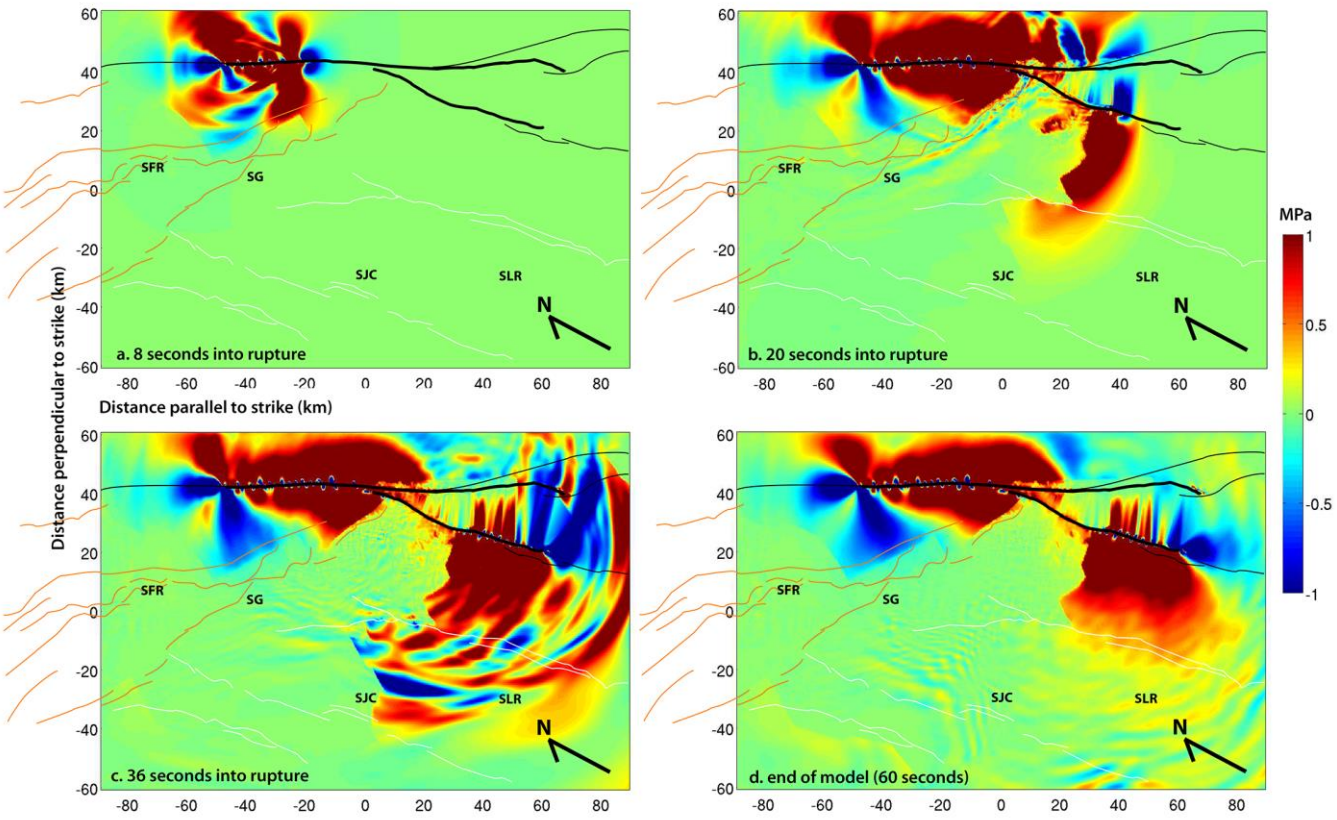

Fig. S3. Coulomb stress changes from a model rupture with nucleation on the SAF at Pallett Creek. Snapshots of Coulomb stress changes, as resolved onto N80E-striking left-reverse faults. The faults included in the model are marked by heavy black lines; the finer black lines represent the continuations of the SAF and SJF. The left-reverse faults of the Transverse Ranges are indicated by orange lines. Panel (a) shows southward-directed rupture along the SAF. In panel (b), rupture has jumped onto the SJF, and a large stress increase has developed ahead of the rupture front. By panel (c), rupture has reached the end of both faults; the large stress increase to the SE continues to propagate away from the end of the fault, but a similar feature has not developed to the NW end of the rupture trace. Panel (d) shows the stress state at the end of the model.

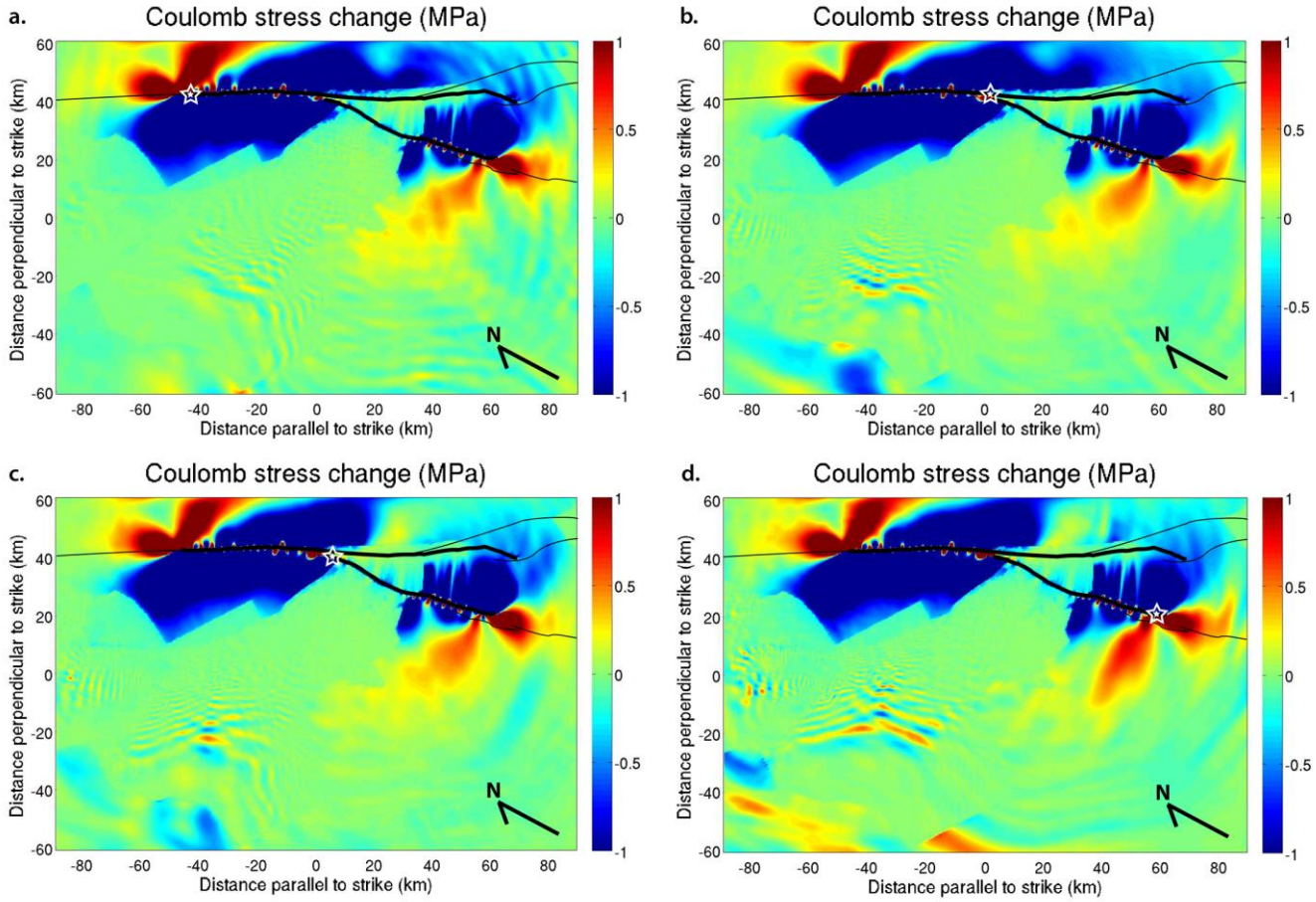

Fig. S4. Coulomb stress changes on the SAF. Final Coulomb stress changes on right-lateral strike-slip faults of the orientation of the Mojave/San Bernardino SAF (N68W), induced by model ruptures with nucleation (a) on the SAF at Pallett Creek, (b) on the SAF at Cajon Pass, (c) on the SJF at Cajon Pass, and (d) on the SJF at Mystic Lake. The faults included in the model are marked by heavy black lines; the finer black lines represent the continuations of the SAF and SJF. There is no first-order difference between these models regardless of nucleation point; all four produce an increase in Coulomb stress on the SAF north of the rupture zone and a decrease along the rupture zone itself.