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Tectonic interactions during rift linkage: insights from analog and numerical experiments

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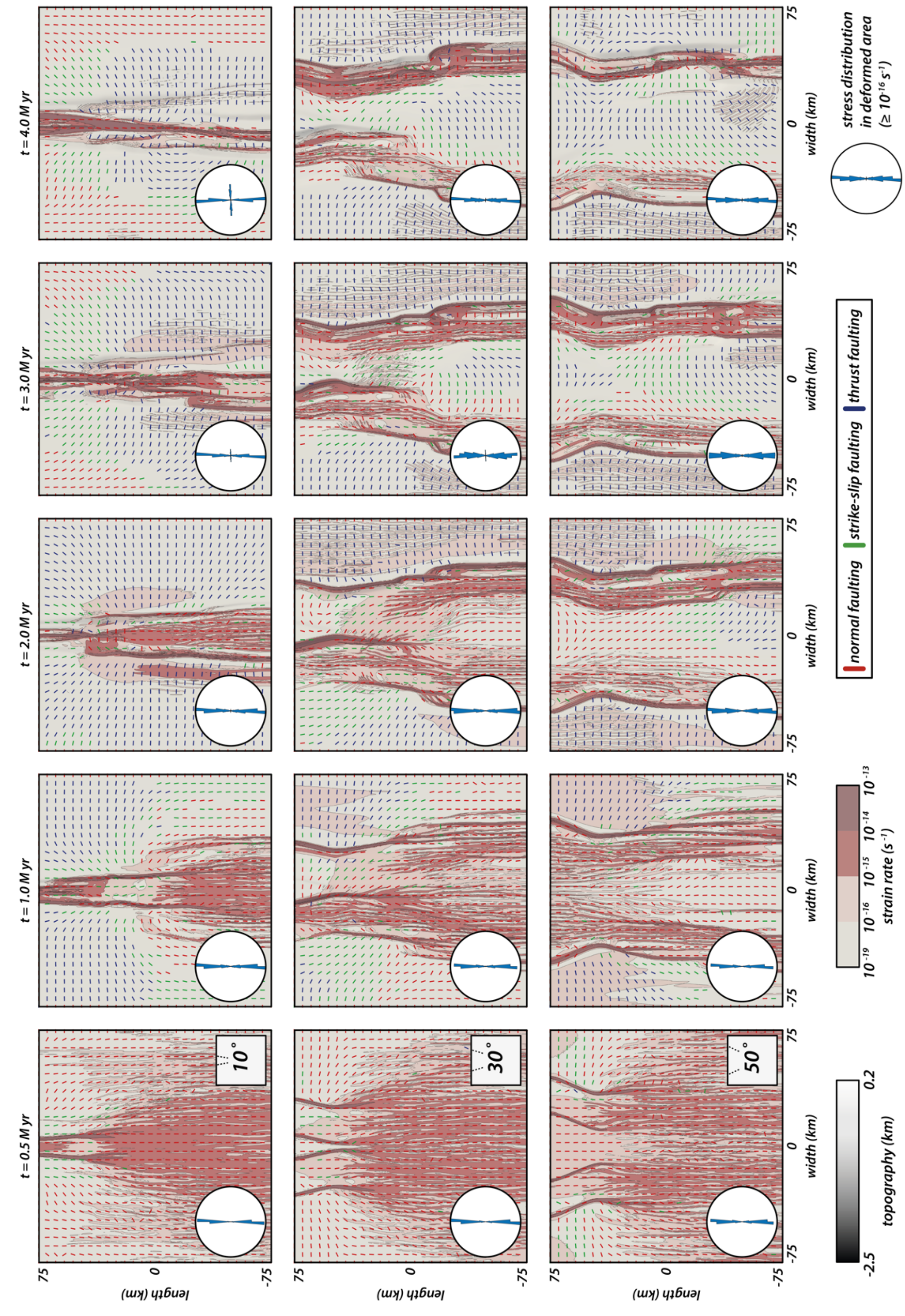

Figure S1: *Model top views of the S_{Hmax} distribution for experiments with v-seed configuration over the entire run time. The temporal evolution depicts zones unaffected by stress re-orientations where material strength is isotropic and zones where strain localization causes material strength weakening and simultaneous stress re-orientation. For an intermediate angle of 10°, the two propagating rift segments overlap and deform as a single rift. For larger intermediate angles, compressive stresses in between the rift segments cause rift deflection away from each other resulting in successively broader rift zones as the segments propagate. Color coding for the stress regime marks normal, strike-slip, and thrust faulting in red, green, and blue, respectively. Rose diagrams show the distribution of S_{Hmax} orientation in zones where active faulting occurs (i.e., strain rate ≥ 10^{-16} s^{-1}).*

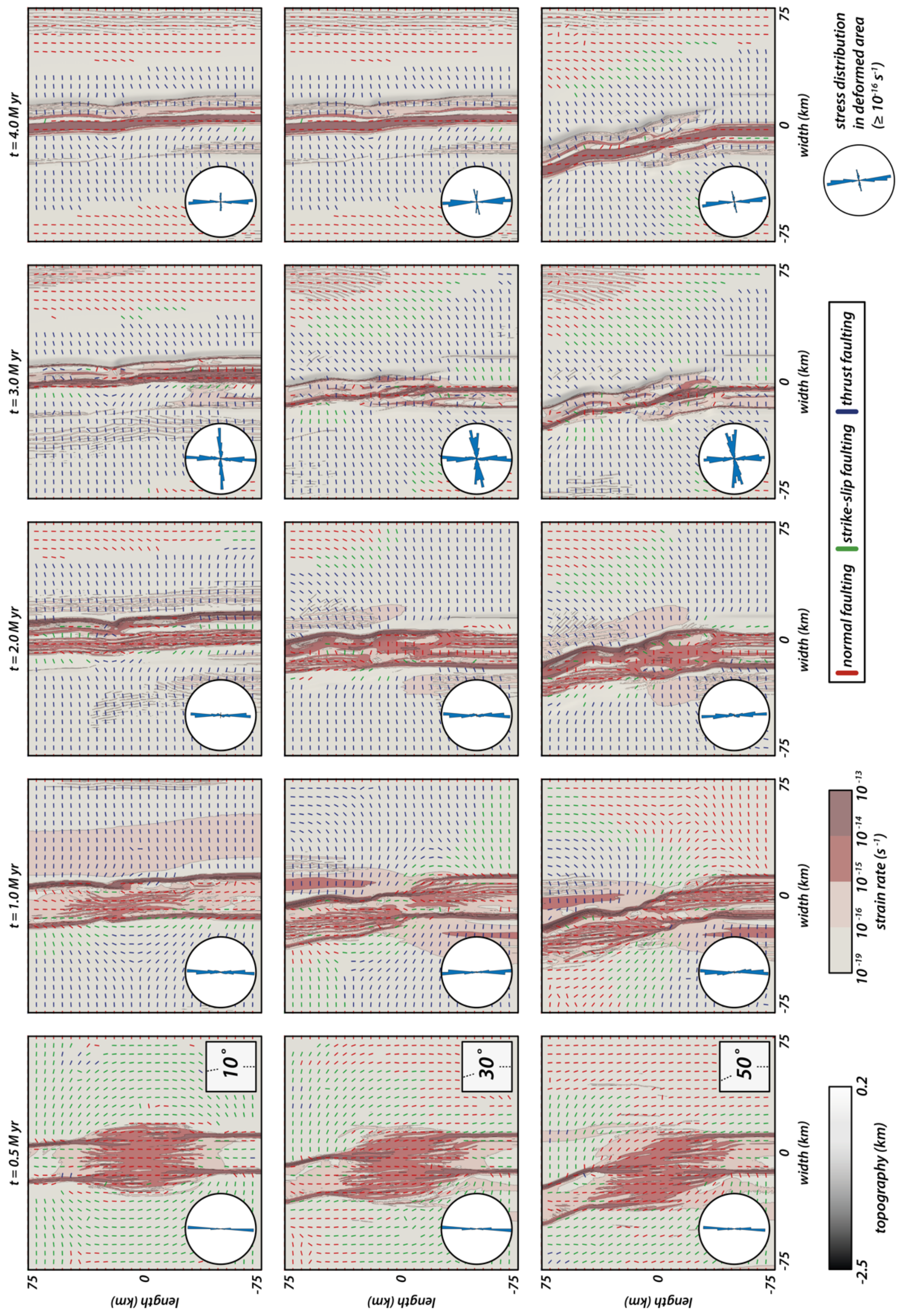

Figure S2: *Model top views of the S_{Hmax} distribution for experiments with i-seed configuration over the entire run time. With increasing intermediate angle, S_{Hmax} distribution successively becomes asymmetric with two distinct styles of stress re-orientation. Along active rift boundary faults, S_{Hmax} re-orientation occur rapidly by a jump, whereas progressive inward migration along active intra-rift faults cause gradual stress re-orientation over a broader deformed zone. Color coding for the stress regime marks normal, strike-slip, and thrust faulting in red, green, and blue, respectively. Rose diagrams show the distribution of S_{Hmax} orientation in zones, where active faulting occurs (i.e., strain rate ≥ 10^{-16} s^{-1}).*

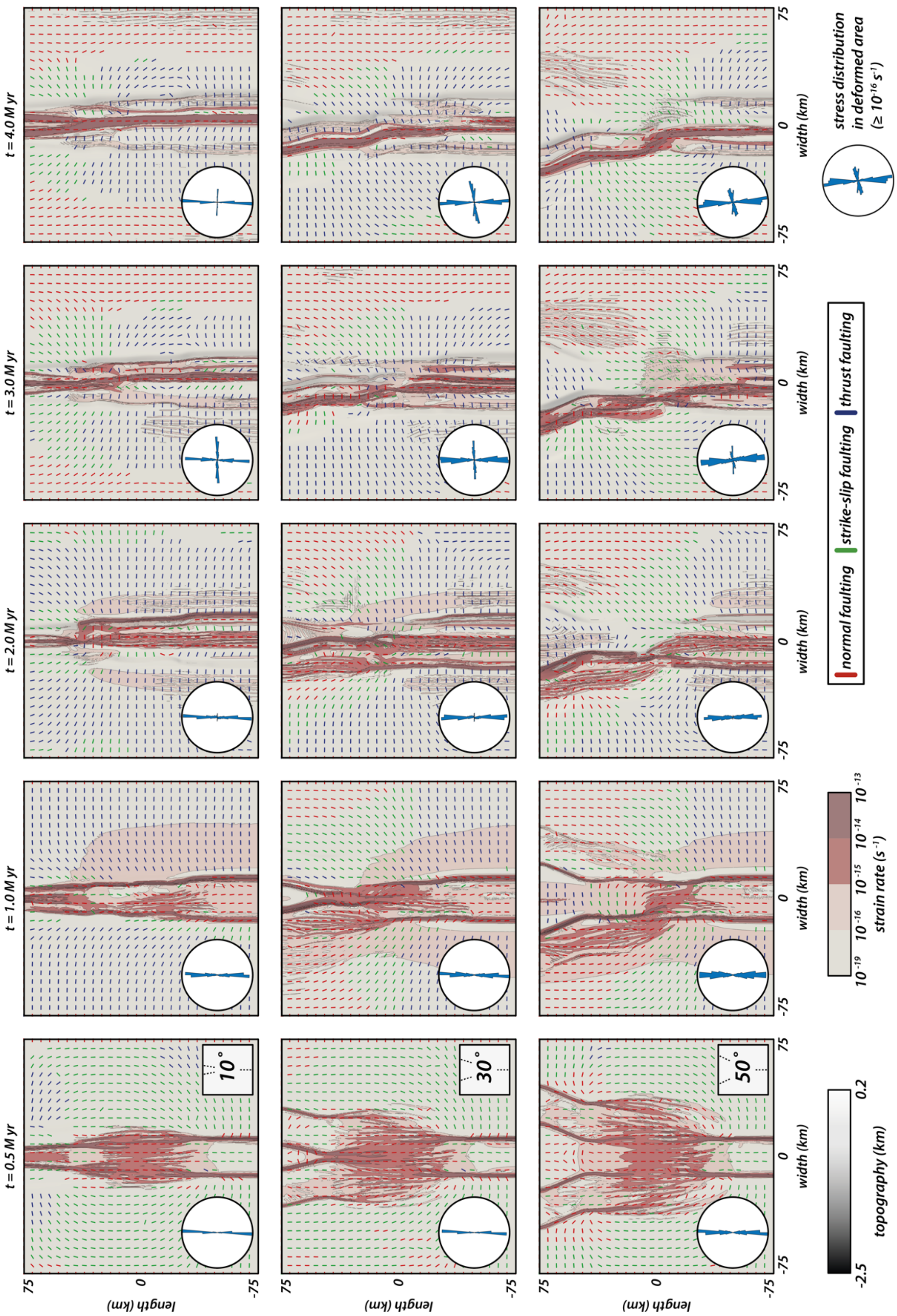

Figure S3: *Model top views of the S_{Hmax} distribution for experiments with y-seed configuration over the entire run time. For larger intermediate angles, the system depicts a change from a symmetrical to an asymmetrical stress distribution coevally with strain localization and linkage of two opposingly propagating rift segments. Color coding for the stress regime marks normal, strike-slip, and thrust faulting in red, green, and blue, respectively. Rose diagrams show the distribution of S_{Hmax} orientation in zones, where active faulting occurs (i.e., strain rate ≥ 10^{-16} s^{-1}).*

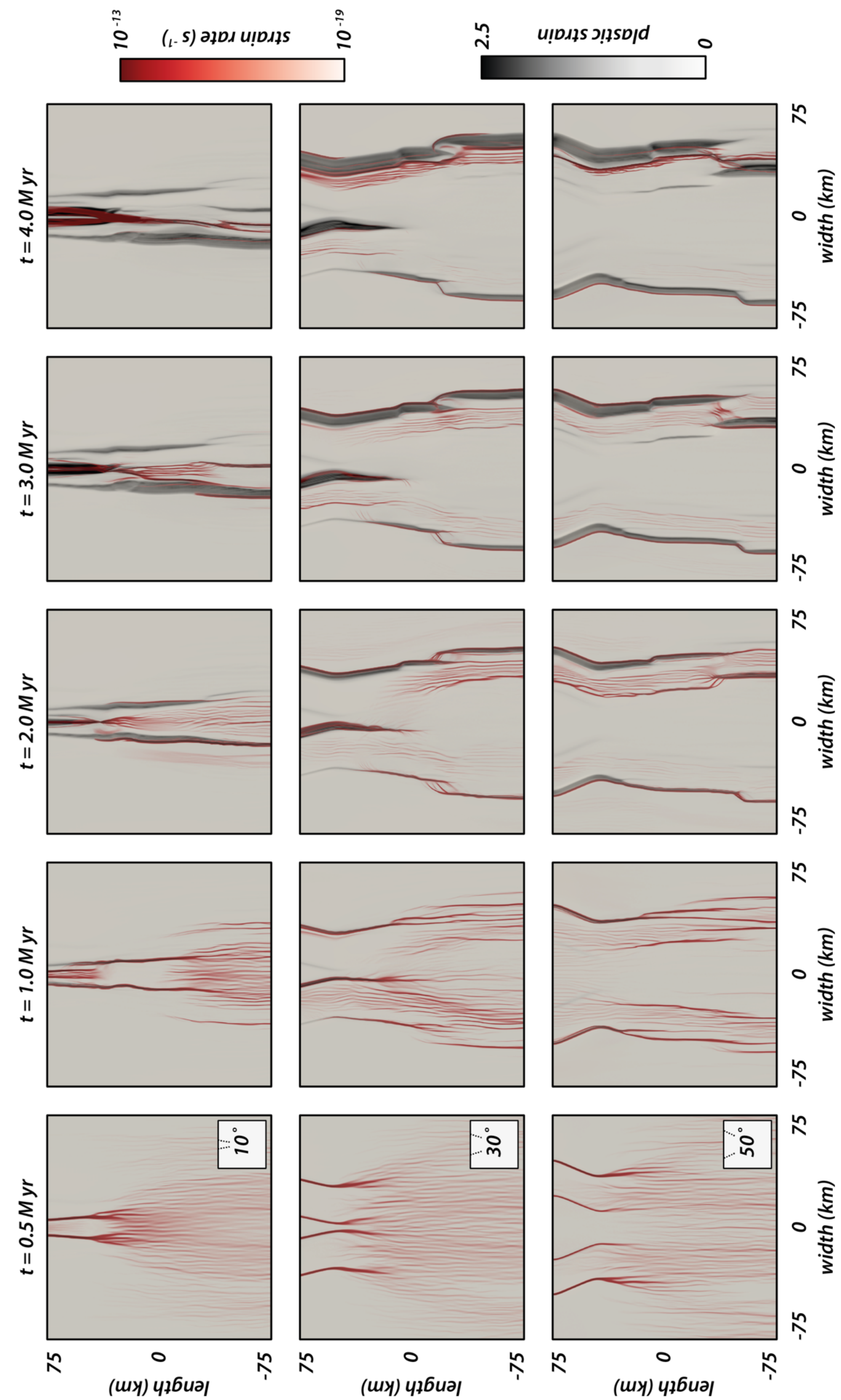

Figure S4: *Model top views showing the evolution of experiments with a v-seed configuration. For all intermediate angles, the rift system broadens as the rift segments propagate. Red and black colors refer to strain rates (logarithmic) and plastic strain, respectively.*

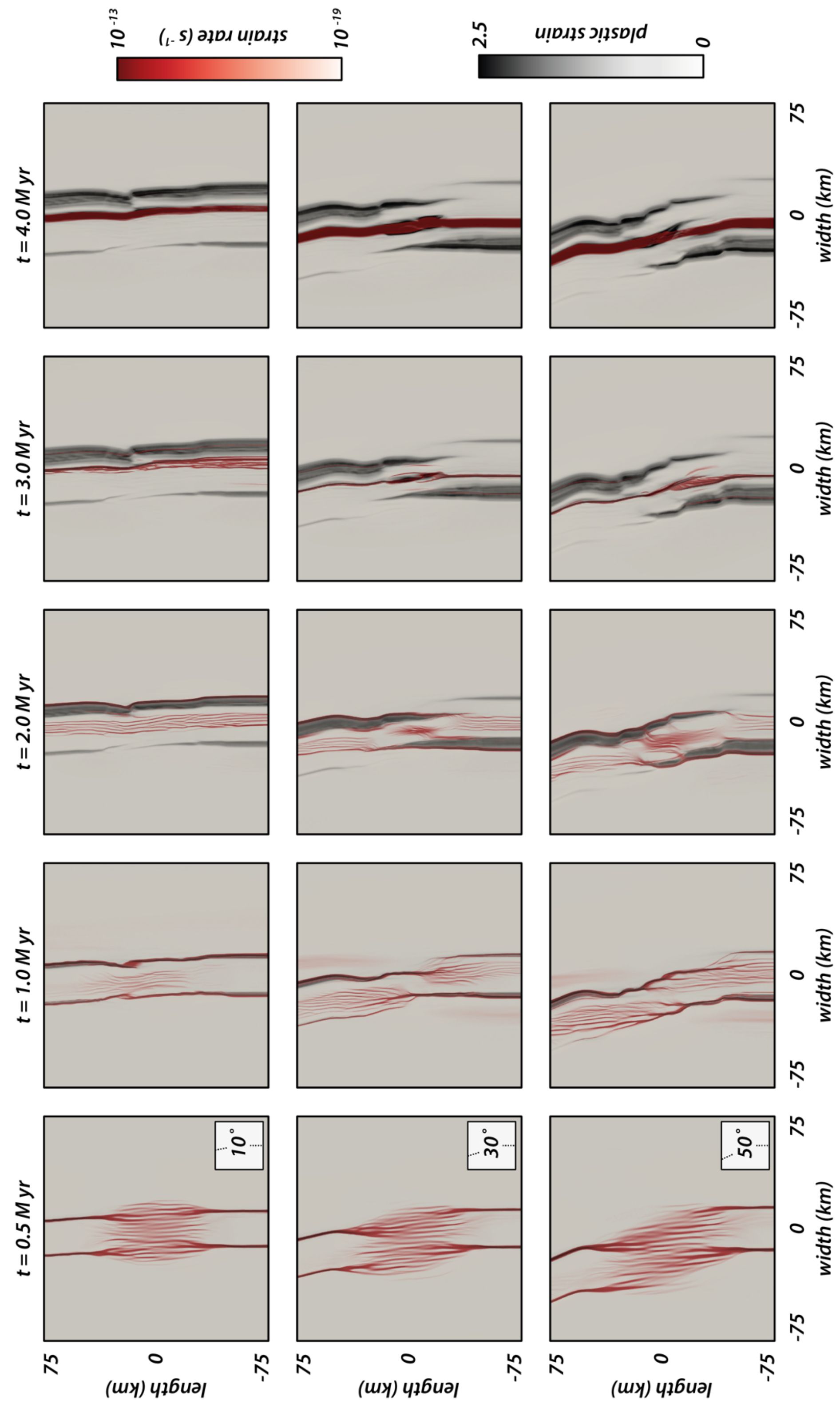

Figure S5: *Model top views showing the evolution of experiments with an i-seed configuration. For an intermediate angle of 10°, the two rift segments link and form a straight continuous rift that accumulates strain mainly on the left-dipping normal fault. For larger intermediate angles, the rift subsequently experiences more segmentation with small left stepping segments towards the rear model part and a polarity flip of main strain accommodation along one prominent rift boundary fault. Red and black colors refer to strain rates (logarithmic) and plastic strain, respectively.*

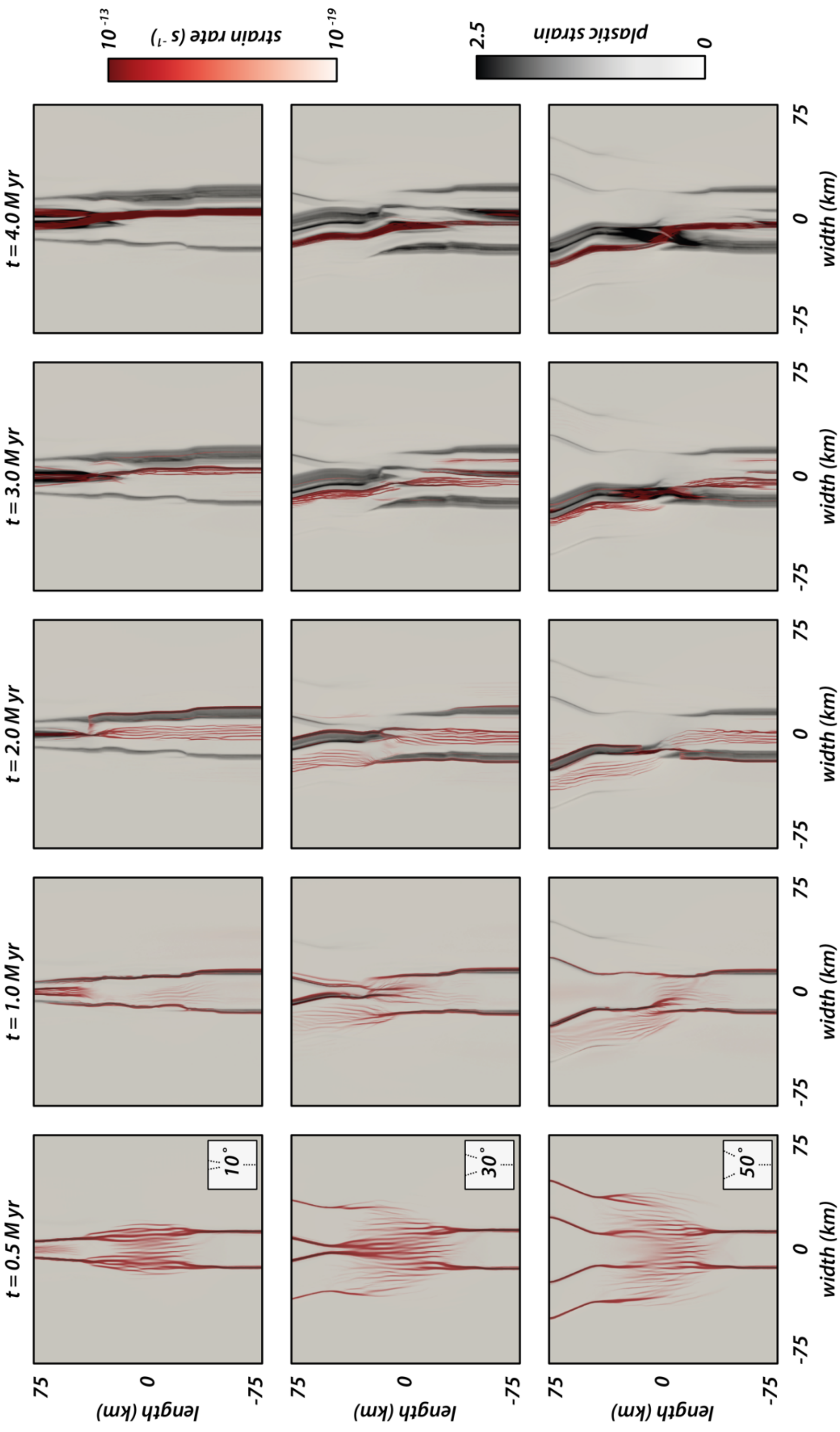

Figure S6: *Model top views showing the evolution of experiments with a y-seed configuration. For an intermediate angle of 10°, the final rift geometry resembles that of a continuous straight rift segment. For larger intermediate angles, two individual rear rift segments form and compete for linkage with the frontal rift segment. Plastic strain well illustrates the asymmetric strain accommodation focused along the left-dipping rift boundary fault of the left rear segment, whereas the right rear segment only experiences minor strain accommodation. Red and black colors refer to strain rates (logarithmic) and plastic strain, respectively.*