Palinspastic Reconstruction around a Recess in the Appalachian Thrust Belt in Georgia, B.S. Cook and W.A. Thomas, University of Kentucky, Department of Earth and Environmental Sciences, Lexington, KY 40506, b.cook@uky.edu, geowat@uky.edu

The characteristically sinuous map traces of orogenic thrust belts include salients and recesses. A distinct Appalachian recess in Georgia comprises an intersection between two regional strikes at an approximately 45° angle. Folds and faults from both structural trends intersect and include clearly defined interference folds, enabling the tracing of both strike directions through the intersection. The intersection and fold interference exemplify a well recognized problem in balancing palinspastic reconstructions of sinuous thrust belts. The palinspastic restoration of thrust belts around salients and recesses immediately applies to orogenic evolution and hydrocarbon exploration.

Palinspastic restorations around bends in thrust belts present difficulty in volume balancing. Cross sections generally are constructed perpendicular to structural strike, which corresponds to the assumed slip direction. An array of cross sections around a structural bend may be restored and balanced individually; however, restorations perpendicular to strike along intersecting thrust faults yield an imbalance in the along-strike lengths of frontal ramps. The restoration leads to a similar imbalance in the surface area of a stratigraphic horizon, reflecting a volume imbalance in three dimensions.

Three alternative solutions are suggested: (1) treating the ends of the fault segments as fault tips, so that displacement diminishes to zero toward the tip; (2) restoring a trapezoidal block (bounded by cross sections perpendicular, respectively, to two intersecting structural trends), so that higher order strains are accommodated within the block by superposed folds and/or faults, etc.; or (3) incorporating successive deformation episodes with contrasting slip directions that correspond to the two intersecting structural trends.