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**New Techniques in Fracture Imaging and Quantification: Applications in the Ellenburger Group, West Texas**

The oil-producing Ordovician Ellenburger Group has undergone extensive karstification and is also fractured. Although diagenesis and burial history of the Ellenburger dolomites have been studied previously, the relative timing and interaction of fracturing events and karstification have been largely neglected. In dolomites affected by karstification, distinction between fractures related to local paleocave collapse and those produced by regional tectonic processes is difficult. Fracture patterns related to these two types of process are likely to be markedly different, even though individual fracture morphologies may be similar.

In this study, well logs and sidewall cores from open-hole intervals in two 45-year-old wells in the Ellenburger dolomite from West Texas were utilized, together with a full-diameter core and image log from a recently drilled well. Fracture sets were characterized in terms of orientation and intensity. Fractures with consistent orientations that crosscut clasts and matrix in paleocave-collapse breccias postdate at least one phase of cave collapse. As a first step in attempting to unravel the history of these rocks, an intensity analysis was conducted on these relatively late fractures

Fractures with apertures ranging from several microns (microfractures) to a few millimeters (macrofractures) were imaged using conventional and scanning-electron-microscope-based cathodoluminescence (SEM-CL). Established techniques for microfracture quantification along scanlines in mosaics of CL images were adapted to allow for low microfracture intensity. This adaptation provided microfracture populations large enough to quantify aperture-size distributions. Such distributions can be extrapolated to predict likely intensities of macrofractures where these have not been sampled in the well bore.