Core-Handling, Marking, Sampling, and Analysis Protocol for Natural Fractures

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After the core has been recovered, removed from inner barrel, locked together, and marked for depth and uphole with red-black lines, but *before the core has been sampled, plugged, or slabbed:*

1. With the core laid out and locked together as closely as possible, mark the core with a very straight, green line (a "Master Orientation line") along its length, even if the core is not oriented. If it is, the MOL should start coincident with the principle scribe line at the top of the core. The scribe will rotate, the MOL should not.
2. Note on a core log all discontinuities in the core (rubble zones, spin-offs, connections, etc.: any breaks in the continuity of the core where it cannot be locked together along its length and where the green MOL must be re-set to coincide with the PSL
3. Sampling etc. can begin here if time is short (sampling for fluid saturations, strain relaxation, etc.), but fracture studies capture significantly more data if sampling can wait until after the first pass at fracture logging
4. Fractures, induced and natural, can now be oriented relative to each other and to the MOL along each continuous interval of core
5. Fractures are described and characterized
6. Fractures sampled as necessary. Examples:
    a) thin section samples
    b) mineralization samples (for isotope and fluid inclusion data)
    c) plugs for fracture-permeability tests (orientation of each plug to be marked by the fracture analyst: commonly *not* directly into the center of the core)
7. Normal slabbing and sampling can begin. For fracture studies, the core should be slabbed normal to the dominant fracture orientation, thus the desired slabbing plane should be marked for each contiguous section of core by the fracture analyst
8. Additional fracture information can be obtained from many cores if the core is examined again after it is slabbed, since smaller fractures sometimes don't show on the rough exterior of a core, and since additional fracture exposures are often created on the ends of the cores.

Lorenz, J.C., and Hill, R.E., 1992, Measurement and analysis of fractures in core; *in* Schmoker, J.W., Coalson, E.B., and Brown, C.A. (eds.), Geological Studies Relevant to Horizontal Drilling: Examples from Western North America: Rocky Mountain Association of Geologists, p. 47-59.

Lorenz, J.C., Warpinski, N.R., Branagan, P.T., and Sattler, A.R., 1989, Fracture Characteristics and reservoir behavior of stress-sensitive fracture systems in flat-lying lenticular formations: Journal of Petroleum Technology, June, 1989, p. 615-622.