Fault Rupture Form (PDA equivalent)

I. Site Information

Site #: ____________________ Observer(s): __________________

Location description: _______________________________________

____

Latitude: __________________ Longitude: ___________________

GPS waypoint #: _____________

Date: _____________ Time: ____________

Offset feature type: _______________________________________

Fault sense: _________________________________

Surface rupture expression:__________________________________

____

Offset material: ____

Fault azimuth: _______° Dip: _____° Dip direction: _____

Width of zone: _________

Afterslip monument established: ☐ yes ☐ no

II. Vector Measurements (see Figure 1)

Slip azimuth: _______ ° Plunge: _____°

Net slip: _______ + ______ - ______ Units: ____

III. Components of Slip (see Figure 1)

Choose one:

☐ Strike slip component ☐ Horizontal slip component

Slip measurement: _______ + ______ - ______ Units: ____

Offset feature azimuth: _______ ° Plunge: _____°

Choose one:

☐ Dip slip component ☐ Vertical slip component

Measurement: _______ + ______ - ______ Units: ____

Side up:____

IV. Afterslip

Reference on afterslip monuments at end of document.

Type of monument: □ Paint stripe □ Quadrilateral

Paint stripe establish date: ____________ Time: ___________

Quadrilateral establish date: __________ Time: ___________

Weather when established:

□ sunny □ partial clouds □ overcast
□ clear □ rain □ snow □ fog
□ hot □ moderate □ cool □ cold

Initial measurements: (see Figure 2)

Tape ID: ______________

Tape type: □ metal □ fiberglass □ cloth □ other _________

Fault azimuth: ________° ± ____; over distance: □<3m □3-10m □>10m

Azimuth AB: ________° ± ______

AB: ________ ± ________ units: ____

BC: ________ ± ________ units: ____

CD: ________ ± ________ units: ____

DA: ________ ± ________ units: ____

AC: ________ ± ________ units: ____

BD: ________ ± ________ units: ____

V. Notes

□ Photos taken? Digital photo prefix: _____

Roll: _____ 1st frame: _____ Last frame: _____

General notes: ____

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VI. Reference Guide

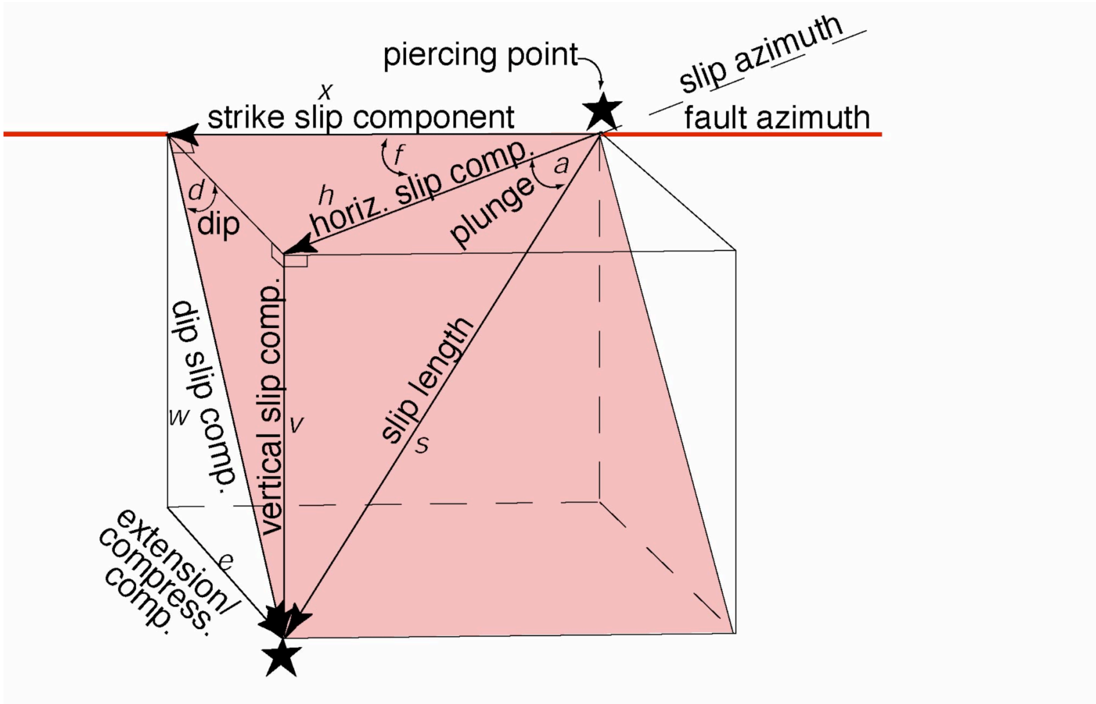


Figure 1

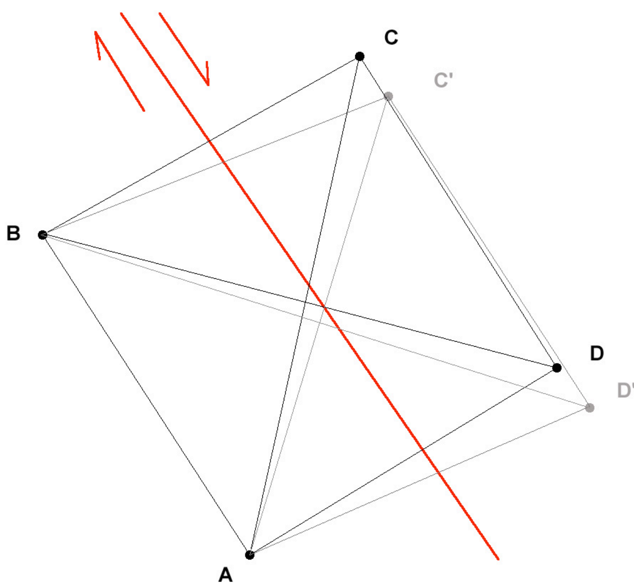


Figure 2

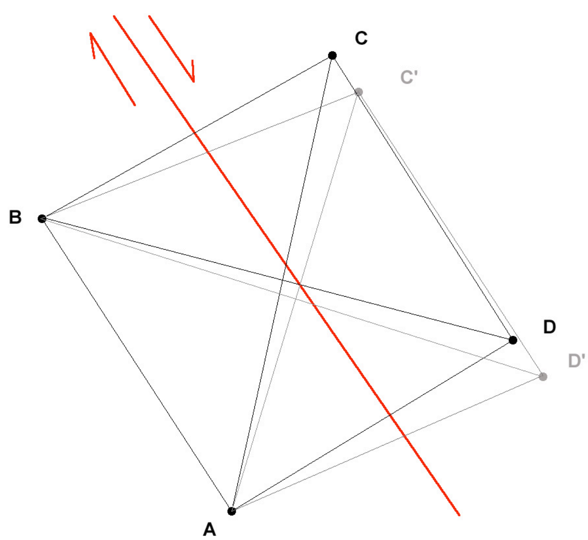
Afterslip reference guide

The following methodology of monitoring afterslip is best suited to a fault with dominantly strike slip displacement. Any appreciable amount of vertical displacement introduces a third dimension to the calculations that is not addressed here.

Initial establishment of quadrilateral

A quadrilateral (array of four survey points) is established across a zone of active fault slip with a baseline (A-B) established on one side of and roughly parallel to the rupture zone and a sub-parallel line (C-D) established across the fault zone from the baseline. Corner points should be labeled in a clockwise fashion for consistency. It is preferable to have sides A-B and C-D longer than the cross-fault lines B-C and D-A.

Initial measurement establishes the length of the four sides and the two diagonals and the azimuth of baseline A to B. (The direction helps ensure that the orientation of the quadrilateral is part of the record). The azimuth of the principal fault or zone of faulting, as established over as much as several tens of meters of fault length should also be noted. Time and date of the initial survey is also recorded. The measuring tape should be metal so that shrinkage or stretch is minimized. The identification/ownership of the tape should be recorded so that the same tape may be used for subsequent measurements. If a fiberglass tape is used, a spring scale should be used in conjunction with the tape to ensure consistent tension of the tape for all measurements.



Subsequent re-measurement of the quadrilateral includes a repeat of all measurements from the initial survey, including date and time. Measurements should preferably be made with the same tape as the initial measurement. If not, this should be noted. If afterslip has occurred, one diagonal should be less than the original value and the other diagonal should be greater than the original value.

Calculations:

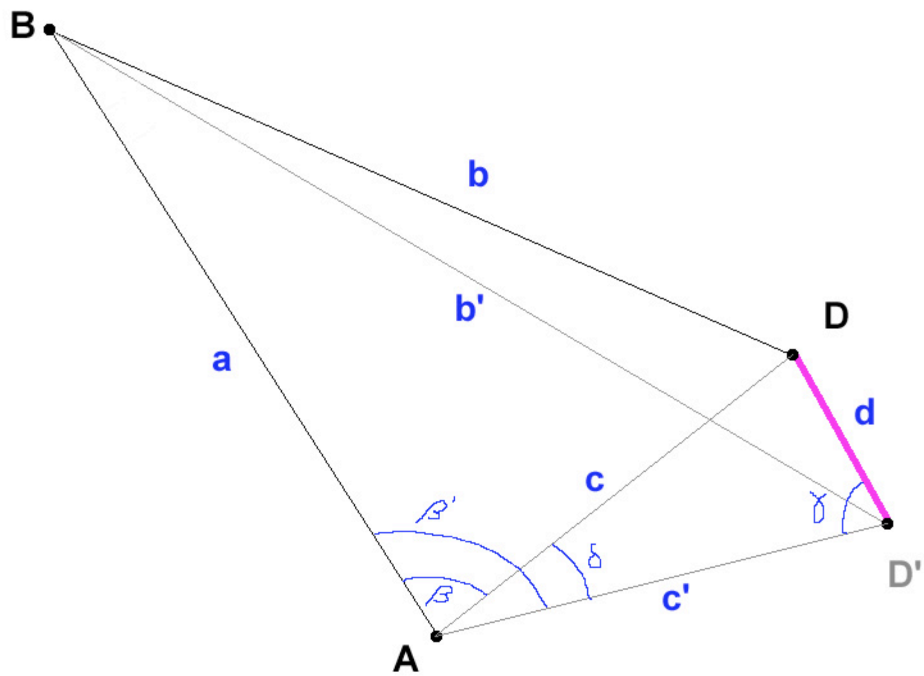
Calculation of displacement of the points C & D are made relative to the baseline (A-B) and are expressed as a slip vector (e.g. DD'). Strike of the slip vector can also be calculated.

Either calculation starts with calculation of the angle between the initial cross-fault line (B-C or D-A) and the baseline. The initial angle is determined by the formula:

$$cos\beta=(a^2+c^2-b^2)/2ac$$

utilizing values from the initial survey. The angle of the resurveyed line is calculated by the same formula (substituting the new length values) and the difference between the two angles (β & β') is the angular deflection of the measured side (δ). The length of the slip vector, d, is then calculated from the angle δ and the lengths of the sides (c & c') as determined in the initial and subsequent survey according to the formula:

$$d=(c^2+c'^2-2cc'cos\delta)^{1/2}$$



The azimuth of the slip vector will usually be close to the fault strike and this will be a reasonable approximation in most cases. Where a significant divergence due to a compressional or extensional component of slip is suspected, the strike of the slip vector is most easily determined by construction, adding β' & γ to the azimuth of AB, where $cos\gamma=(c'^2+d^2-c^2)/2c'd$.