APPENDIX 1

FAULT PARAMETERS

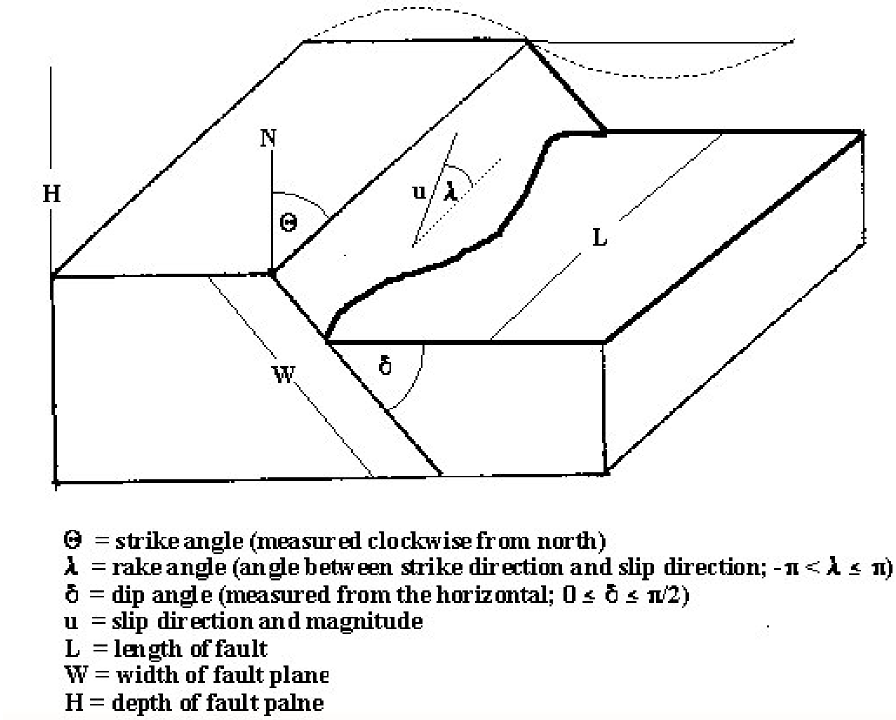

Figure 1. Schematic of fault, with the necessary input parameters.

In the discussion that follows we will follow Aki and Richards (1980) convention.

Fault origin: X0, Y0

X0 = longitude (> 0) of the origin of this segment

Y0 = latitude of the origin of this segment

(We have to be consistent in the values assigned to X0, Y0 and the values assigned to the rest of fault parameters. For example, the fault strike angle - see below for definition - is given looking along the fault from the position X0, Y0)

Fault orientation is specified by ***strike (1)*** and ***dip (*)***, and then either ***rake (8)*** or the ***plunge (()*** is used to specify the direction of slip. Note that the rake is measured within the fault plane. A fault has two surfaces, and the one to the left in Figure III.1 is called the ***foot wall***. The surface to the right is called the ***hanging wall***. Slip ***u*** is taken as the direction of the hanging wall relative to the foot wall. Rake *8* is the angle between the strike direction and slip: *-B < 8 # B*, with *8* > 0 when the displacement of the hanging wall has an upward component. If * is neither 0 nor *B/2* and *8* is within the range (0,B), i.e., the hanging wall is displaced upwards relative to the foot wall, the fault is termed a ***reverse fault***, or a ***thrust fault***. However, if *8* is within the range (-B ,0), i.e., the movement of the hanging wall has a downward component, then the fault is termed a ***normal fault***.

Instead of rake some authors use the plunge, which is measured in the vertical plane. Measuring the plunge from the horizontal down to the direction of the slip ***u***, we find that

sin(() = -sin(8)sin(*).

A ***strike-slip fault*** is one for which * = *B/2* and *8* = 0 or *B*; the choice of hanging wall and foot wall is then arbitrary, and two possible choices can be made for the strike direction. It is useful however, to establish a convention so that right-lateral and left-lateral strike-slip faults can immediately be distinguished by *8* values alone. A ***right-lateral***

fault is one for which an observer standing on one block sees the other block as having moved to the right. Our convention is to fix on either one of the two possible strike directions and label the right-hand block (as viewed by an observer looking along the strike) as the hanging wall. This decides which of the two fault surfaces is used to define *8*, and clearly *8* = 0 is a left-lateral strike-slip fault, and *8* = *B* is right-lateral.

A dip-slip fault is one for which * = *B/2* and *8* = *B/2* or -*B/2*. Again, there is ambiguity in the strike direction. We take the foot wall to lie down in the down-dropped block, and the strike direction as again that for which the hanging wall is on the right. Then a dip-slip fault always has *8* = *B/2*.

u = magnitude of segment (fault) dislocation, or slip magnitude (in meters). In the computer program it is symbolized by D0.

L = segment (fault) length along the surface of the Earth (in meters). In the computer program it is symbolized by L0.

W = width of the segment (fault) plane (in meters). In the computer program it is symbolized by W0.

1 = segment (fault) strike angle (in degrees clockwise from North). The fault dips down to the right of the strike direction. It varies between 0 and 2B. In the computer program it is symbolized by TH.

* = segment (fault) dip angle, or direction (in degrees). It is measured from the horizontal, and it lies between 0 and 90 degrees. In the computer program it is symbolized by DL.

8 = rake, or slip direction relative to the strike direction (in degrees measured in the lower fault plane). In the computer program it is symbolized by RD.

H = segment (fault) depth (in meters). In the computer program it is symbolized by HH.