Tables of Chapter 2

Dieterich-Ruina law	Slip-weakening law
$m_* = 0$	
$s_n^{eff} = 1$	
$a = 0.75$	$t_u = 18.60196$
$b = 1.6$	$t_f = 12.32062$
$L = 1.6$	$d_0 = 1.6$
$F\left(x_1, t=0\right) = \begin{cases} F_{nucl} = 4 \cdot 10^{-3} & , x_1 \in [-1, 1] \\ F^{ss}\left(v_{init}\right) & , \text{elsewhere} \end{cases}$	
$v_{init} = 9 \cdot 10^{-2}$	
$t_0 \equiv t(x_1, t=0) = t^{ss}(v_{init}, F^{ss}(v_{init})) = 15.65758$	$t_0 = 15.65758$
$Dx = 0.2$	$Dx = 0.1$

Table 2.1. Input parameters, in nondimensional units, used in the simulations performed to compare the faulting behavior arising by applying different constitutive laws. The reference coeficient of friction m_* is assumed to be 0 for semplicity. The constitutive parameters of SW are obtained by using the correspondency formulae (2.9): we have obtained the value of v_2 from the state variable ($F^{ss}(v_2) = L / v_2$) and then we have calculated t_u and t_0 from (2.9a) and (2.9b), respectively. The elastic medium surrounding the fault line is poissonian ($l = m = 1$) and $r = 1$ in nondimensional units. In order to resolve adeguately the coesive zone, we have introduced in the SW simulation a grid of 601×601 points, while a grid of 301×301 in the DR one. The discretisation in x_1 and in t is made to map identical spatial and temporal extensions in two simulations.

Slowness law parameters

$l = m = 27\ GPa$,	$v_P = 5196\ m/s$,	$v_S = 3000\ m/s$
$m_* = 0.56$,	$s_n^{eff} = 100\ MPa$	
$a = 0.012$	$b = 0.016$	$L = 1 \cdot 10^{-5}\ m$
$v_{init} = 1 \cdot 10^{-5}\ m/s$		

$$F\left(x_1, t = 0\right) = \begin{cases} F_{nucl} = 1 \cdot 10^{-4}\ s & , x_1 \in \left[-1.5\, m, 1.5\, m\right] \\ F^{ss}\left(v_{init}\right) & \text{, elsewhere} \end{cases}$$

$t_0 \equiv t(x_1, t = 0) = t^{ss}(v_{init})$

$Dx = 0.01\ m$ $\qquad$ $Dt = 0.95$ 3½ $Dx/(2v_P) = 1.58 \cdot 10^{-6}\ s$

$w_{CFL} = v_S\, Dt/Dx = 0.342$

Table 2.2. Input parameters used in the simulations. The values of parameters a, b and L listed in this Table identify the reference configuration.