REVIEW

The presented work is devoted to the vital problem of active fault dynamics. Discussed are the questions of stick-slip emergence under constant friction factor and relations of propagations of disturbances in the medium. The authors have performed numerical experiments on the basis of 1D spring-block Burridge-Knopoff model and have computed the regularities of propagation of disturbances in an infinitely long elastic rod exposed to shear load with a system of elastic springs. It is shown in the work that sliding at alternating velocity may emerge under constant friction factor. It is also shown, that in the frames of the 1D model of infinitely long elastic rod any disturbance propagates at the velocity of p-waves, and as it propagates its amplitude decreases. The assumption is put forward in the work that this effect can account for the supersonic propagation of rupture along a fault.

I think that using such simple models has to be accurately grounded, and even more arguments are needed to apply the obtained results to real processes taking place in natural fault zones. The oscillations considered in the first part of the work can't be called "stick-slip", because the latter is characterized by a prolonged stage of rest followed by an abrupt sliding.

There are some remarks and comments as follows:

1. There is no "discussion" in the work, where it would be appropriate to discuss in detail the non-linear effects of disturbance propagation obtained in the work and their links to the processes in nature.
2. In Parts 2 and 3 all the variables and constants used in equations should better be listed once in a single table instead of repeating the terms in different equations with different meanings.
3. In Part 3 the simplest 1D case is considered, so, a disturbance, once emerged, can propagate only along the rod, and the law of its propagation is defined by the parameters E and ρ, which means that the disturbance can only propagate at the velocity of p-wave, because no other motion is possible.
4. The captions should be revised to make them more substantial, clarifying and informative.

Less important remarks:
Raw 38. Cohee and Beroza, 1994a → Cohee and Beroza, 1994
Raws 48-49. “However, the faults ... can produce sliding over initially stable fractures/interfaces” – a citation is needed.
Raw 64. The citations should better be replaced by (Brace & Byerlee, 1966).
Raw 82, Eq. 2. As a matter of fact, this equation defines the rule of the frictional force action. When V=0 the frictional force can act on a body only provided that the shear force is not zero. In the presented system this condition is not true.
Raw 87, Eq.4. It is faulty to designate dimensional and dimensionless quantities by the same variables. Please, submit relations for all the dimensionless variables.
Raw 93, Eq.5. If all the variables are dimensionless, it is unclear, why the relation μN appears? It misses in the plots presented in Fig.2.

Raw 95, Fig.2. Under the action of a frictional force constant modulo, the energy should dissipate, but it doesn't. This fact should be explained.

Raw 105. Fig.2 presents harmonic oscillations, but not the regime of "stick-slip".

Raw 114. $\tau_{fr} = k\mu\sigma_N$. What is k?

Raw 115, Fig.3. There is τ_f in the figure, but not τ_{fr}.

Raw 126, Eq.8. It is unclear, what is k – the stiffness of a single spring, of all the springs, or the specific stiffness of springs per unit length? Attention should be paid to Eq.1, where the same notation is used.

Raw 129, Eq.9. The formula is presented in a faulty way. If one supposes that $\Delta V=u$ is a re-introduced new value, it appears that the increment of velocity equals to displacement, which is impossible.

Raws 137-145. Equations 11-14. All the constants and variables should be clarified.

Raw 145. Eq.14. What is the function J_0, what are the coefficients *i* и *b*, and what is the difference between the Bessel functions J_0 и J_0'?

Part 3.1. Since the results are presented in the form of time series of dimensional variables, parameters of the model should be designated, which were used in calculations. The visual presentation of results is not pictorial enough. To my mind, the grid is too coarse. The dimensionality of Y-axis is not mentioned.

Raw 152. Fig.3 (right). It is better to plot all the curves using a single X-axis, and one and the same scale of the Y-axes (may be, it's better to use the logarithmic scale).

Raw 152. Fig.3 (left). Propagation of the disturbance is not seen at all. The Y-axis should be inverted, or even better, re-calculated for the disturbance when $u(t, x) > 0$.

The function of pulse shape is specified in a poorly comprehensible way. It's better to give it in a standard mathematical form.

Raw 155, Fig.4 (left). The disturbance is not seen in the area of big t. The viewing angle should be changed. No need in the inscriptions in the plot.

Raw 162, Fig.5. The amplitude of the disturbance is maximal at the initial moment and reduces with time (raw 158). But, in the figure the amplitude is zero in the range of 0-9 s, then it increases in the range of 10-14 s, and then it decreases. What really shown in the figure?

In view of all the remarks above, I think that the paper needs an essential improvement.