

## ***Interactive comment on “Two-dimensional numerical investigations on the termination of bilinear flow in fractures” by A. E. Ortiz R. et al.***

**A. E. Ortiz R. et al.**

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"The paper by Ortiz et al. is a well-written paper that discusses the end time of the bilinear flow in fractures which has an important practical significance in the long term forecast, for exploitation of liquid or gaseous resources. By numerical simulations using a two dimensional finite element model and non-dimensional formulation, the authors analyse the evolution of the well pressure and the evolution of the pressure along the fracture and in the matrix, and adopt the transition criterion and the reflection criterion to sum up the law of the end of the bilinear flow. So I think that is a very valuable reference article. However, there are some minor issues with the current version which the authors may need to modify. I recommend amended as follows: "

1.) "Section 2 should further explain the background formulas and detail the derivation

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process. "

reply: We will modify equations 1 and 2 by explicitly using the parameters  $k_m$ ,  $s_m$ ,  $\eta_f$ ,  $T_F$ , and  $S_F$  and better explain the meaning of the different terms of the equations in the text. Corresponding diffusivities will then be introduced and explained in text.

2.) " $\alpha_b$  of Section 3.2 is known from Fig. 5(a) that when  $p_N = 0.01$  and  $0.05$ ,  $\alpha_b$  is a constant for a certain time interval, not  $\alpha_b = 3$  and  $2$ , respectively. And I suggest that the value of  $\alpha_b$  need further introduction. "

reply: When describing Eq. 12 (obtained from Fig. 4) in the text we will clarify that for certain time intervals  $\alpha_b$  is "about" 3 and 2 for  $p_N = 0.01$  and  $0.05$ , respectively. Moreover in Fig. 5a we will add that the constant  $\alpha_b$  presented in Eq. 12 calculates as  $x_{iD}/(T_D \tau^{1/4})$  for a certain time interval.

3.) "According to Eq. (13)  $x_i(t) = a_B (D_b t)^{1/4}$ ,  $x_{iF}(t) = a_b T_D \tau^{1/4} x_F$  is introduced, not Eq. (12). "

reply: We will emphasize that Eq. 12 uses the non dimensional variable  $x_{iD}$  ( $=x_i/x_F$ ) and thus is equivalent to the above equation.

4.) "The interpretation of the intermittent acceleration needs a picture in line 20 of P404."

reply: We will prepare a sketch illustrating the process of reflection.

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Interactive comment on Solid Earth Discuss., 5, 391, 2013.

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