



SDI Review Form 1.6

Journal Name:	<a href="#">Physical Science International Journal</a>
Manuscript Number:	Ms_PSIJ_42783
Title of the Manuscript:	An elastic-plastic finite element analysis of two interfering hemispheres sliding in frictionless contact
Type of the Article	Original Research Article

**General guideline for Peer Review process:**

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound. To know the complete guideline for Peer Review process, reviewers are requested to visit this link:

(<http://www.sciencedomain.org/page.php?id=sdi-general-editorial-policy#Peer-Review-Guideline>)



SDI Review Form 1.6

**PART 1: Review Comments**

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<b>Compulsory</b> REVISION comments	<p>This work is an interesting work, however there are some issues to be clearly explained as following</p> <ol style="list-style-type: none"> <li>1. page4 line9, tridimensional should be three-dimensional;</li> <li>2. page 4 line 17 defined in [32], should be "defined in reference [32]".</li> <li>3. page 5, R1=R2=1m, then equivalent radius <math>R=0.5m</math> as deduced from equation(3), and then equation (8) can be deduced as <math>U_c = \frac{\pi(CS_y)^5}{480E^4}</math>, is it? so why not deduce it to a simple formula</li> <li>4. in page 5, the equivalent modulus of elasticity <math>E' = 0.5 * (\frac{E1}{1-\nu^2}) = \frac{0.5*200}{1-0.32*0.32} = 111GPa</math>(bulk elastic modulus), in page 7 E is E1 or E' in equation(4), it should be pointed out, or else it confuses the readers.</li> <li>5. page 5, equation (2) is expressed as :  <math display="block">\frac{\sigma_e}{p_0} = \frac{1}{2} \sqrt{[(1-2\nu-2\xi^2(1+2\nu)+2(\xi+\xi^3)(1+\nu)\text{arccot}(\xi)]^2/(1+\xi^2)^2} = \frac{1}{2} \frac{(1-2\nu-2\xi^2(1+2\nu)+2(\xi+\xi^3)(1+\nu)\text{arccot}(\xi))}{(1+\xi^2)}</math>, is it? you should make sure this equation.</li> <li>6. page 5 equation (3) R1 and R2 should be pointed by schematic figure. equation (4) is the same situation.</li> <li>7. page 5, equation (5) and (6) are got from others or by empirical formula based on experimental data.</li> <li>8. page 17, figure 3 b),the maximum Mises stress reaches 1.04E9Pa which is higher than yielding strength of the steel (915MPa), and Page 18 Figure 4b has the similar result of 378MPa &gt; 310MPa of Al. Under such condition, the increment theory should be employed to explained this phenomenon, but in the article, I didn't find increment theory, can you explain why. In addition, in the model , you didn't introduce the stress-strain relationship during plasticity processing.</li> <li>9. page 23 Figure 7 shows us the plasticity deformation, however, in the previous page the plastic model and plasticity parameter doesn't be presented.</li> <li>10. page 29, the author should explain why the curve Fy/Pc is not a symmetrical figure, and what reason causes this displacement (in Figure 12 and Figure 13).</li> <li>11. Energy loss in equation (9) is only a two-dimensional model, and the energy loss in y direction can't be neglected in the model.</li> <li>12. page 44-50, in Figure 24-28, actually, the data used in SAW model were also obtained from Abaqus calculating, which has senseless meaning for comparison, isn't it. I suggest to delete these comparison.</li> </ol>	<ol style="list-style-type: none"> <li>1. Corrected</li> <li>2. Corrected</li> <li>3. The viewer is correct in the math, but the reduction to what he/she offers would limit his/her Eq. specifically to this work, while Eq. (8) valid for any general case of R1 and R2, including the current work. The value of UC is given in Table 2 anyway, so change is made here.</li> <li>4. The information appears on page 6, however, subscripts are now added to parameters in Table 1.</li> <li>5. The equation in the paper guarantees a positive value for radical and the entire calculation, while the reviewer's Eq. does not. No change is made.</li> <li>6. See clarification highlight on page. 5 "For two bodies 1 and 2 that may have distinct radii and material properties,..."</li> <li>7. No. They were obtained from the same reference [38], which is added.</li> <li>8. The reviewer must have missed the statement on page 6: "...in order to help convergence, a bi-linear material model with a 2% strain hardening based on the elastic modulus is used." That explains the point made by the reviewer. A slight change of wording appears now on page 6.</li> <li>9. In Fig. 7 the residual plastic strains are shown (not "plastic deformation"). In general, I do not understand this comment.</li> <li>10. It is clearly explained as stated in the text – see the entire paragraph: "The normalized vertical reaction force, Fy/Pc, as shown in Figures 12 and 13, show a nearly symmetric pattern about the x/R axis (vertical alignment). As interference increases the maximum forces occur earlier in the sliding progression. This can be attributed to the fact that plasticity is initiated earlier as interference increases...."</li> <li>11. Before Eq. 9 it is stated that it is "the <u>net</u> energy loss in sliding." It is the work done by Fx. No changes are needed.</li> <li>12. No, SAM did not use ABAQUS at all – SAM's results have been obtained from a dedicated self-coded program (see Ref [33]). The comparisons are of value. No changes are made.</li> </ol>
<b>Minor</b> REVISION comments		
<b>Optional/General</b> comments		