

RESPOND TO REVIEWS ON THE MANUSCRIPT [11]

We thank the reviewer for their assist to identify the weakness of our work and suggesting us how to improve it. Some major revisions have been made. About three pages of content have been added. One minor experiment is added. Figures were corrected and lots of corrections suggested by the reviewers have been applied.

We also provided some media as online supporting materials. A video resulted from the numerical model and part of the code used in the numerical model.

We attached another version of the manuscript with some revisions highlighted for the reviewers.

Reviewer 1:

“1) Equation (1) and (2) together with figure could be improved to show more clearly the definition of the quantities involved. What is Δr in the figure? The quantities t and w are not defined. It is not clear how (2) (although true) is a consequence of (1); especially from where comes the factor $(1-\cos \theta)$?”

All corrected. We added all the details and calculations in that section.

“2) In figure 2 the quantities x and y are not defined. “

We added a description to the figure. x axis is actually horizon.

“3) In figure 9 it is difficult to see which curve is the analytical and which is numerical one. Making one of the curves dashed would make it much more clear.”

Corrected. Thank you for your helpful suggestions.

Reviewer 2:

“No numerical model assumptions are mentioned in the text.”

We added a detailed part for both numerical model and theory to explain the assumptions and concepts.

“The possible outcomes of this approach should be discussed in much more detail and should be summarized in conclusions at the end of article.”

Quite a lot of descriptions and discussions have been added.

“There is no error analysis. Only one single tape (?) was tested? This is what one can conclude from the article”

One paragraph is added for error analysis in discussion part and some details have been added to experiments (types of experimented adhesives, etc.).

“The article is fairly understandable. There are a number of spelling errors (spell check strongly suggested)”

Tried my best to improve it.

“– What is the final answer: what is the necessary (minimal?) force to be applied to remove a piece of tape? Does it depend only on angle? What with the peeling speed?”

We do not interpret the question as: find the minimum force. We defined our objective as “Finding the force under a static condition”. This is achieved in formula (1) and figure 10. Additionally we tried to illustrate what really occurs in this complicated process (especially with the use of numerical model).

Indeed peel rate is a significant parameter, but as I have mentioned in the manuscript, it is quite complex (according to reliable resources referenced in the manuscript). Peel rate is simply neglected by conducting experiments under a static condition.

The final result of our work is included in Figure 10, Formula 9 and the attached video.

“– What are the essential parameters in the system?”

There are many influential parameters such as environmental conditions (temperature, humidity, etc.). The most important may be the physical and chemical properties of adhesive and adherend materials. Also peel rate which is highly influential and brings lots of complications. But in our work not all of them are. Peel angle is the most important parameter in our investigation.

“– What is a slip-stick problem?”

It is related to the dynamics of the peeling and since our investigation is under a static condition, we believe this is not quite relevant.

***“– Attach a chapter (large one) with a summary and detailed conclusions.
– Consider revising any parts of the text that are unspecific and do not clarify of what results are obtained and what conclusions are drawn.
– Write more about your theory: what physical laws you use, why, what are the assumptions exactly, etc.”***

Quite a lot of content has been added.

“– Please add the details of the references.”

Corrected. Thank you for your helpful suggestions.

Reviewer 3:

“Then we get a description of a many-springs numerical model. One thing that I lack is the description of what is actually depicted in Figure 3”

We added descriptions to figure 3. We also added a video as online supplement which illustrates the algorithm.

“The calibration section attempts to fit the numerical model's free parameters to match the measured Force(angle) dependence. What are the authors actually calibrating for the numerical model? I would like to see that. Is it Young's modulus? The "breaking point" of the little springs? Their density?

On the other hand, it looks like the "calibrated" model then gives a quite accurate prediction for a "double-layer" tape experiment. Was it done with the same tape, just with two layers of it? That should change just E , and leave the surface energy per area unchanged. Did you do this for the prediction from formula (2) as well? I'd like to see that too”

We added sufficient amount of description regarding calibration part. There is only one free parameter for each theory. γ (surface energy density) for the analytical theory and l_{critical} (critical length for the springs) in the numerical model. The same type of adhesive tape is used and the only varying parameter is thickness which affects the constant of vertical springs and t parameter in formula (9).

“I am surprised by the conclusion of the authors, claiming that their "springy" model should work well for small theta as well... In fact, I would not expect it to work at all. To convince me, I would like to get a picture of these special cases, depicting how their springs were actually pulled. Were there only two of them? It is not clear to me”

That part was ambiguous and partly incorrect, we completely rewrote it. Thank you for mentioning, we think now it will convince you.

“Small typos”

Thanks! Quite useful.

Editorial request

“Figure 7: units on the x-axis and the y-axis?”

Corrected. x-axis is dimensionless.

“References: Please type the references in a way that the readers may immediately understand where and how they may look for a document. All references are books? Add the years of the publication.”

Publication year is added.

Regards,
Hossein Azizinaghsh
Hamid Ghaednia