SCIENCEDOMAIN *international*
www.sciencedomain.org

SDI FINAL EVALUATION FORM 1.1

PART 1:

Journal Name:	**Advances in Research**
Manuscript Number:	**2014_AIR_11388**
Title of the Manuscript:	**Crack-growth on canvas paintings during transport simulation monitored with digital holographic speckle interferometry**
Type of the Article	**Original Research Article**

PART 2:

FINAL EVALUATOR'S comments on revised paper (if any)	Authors' response to final evaluator's comments
Authors have made a good effort in addressing all the points in my previous comments. The paper has improved quite significantly and it is now clearer. Some points: 1- My first comment about the objective has been clarified in the author's response. However, I just wanted to state that it may be a bit obscure to the reader, just in case the authors might want to clarify it in the paper. 2- About my comment regarding fitting the data to the function y=exp(a+bx+cx^2) of course I understand why fitting experimental data to math functions is done. And now I understand that the exponential growth is important per se, which seems to be a major finding in the investigation. My comment was regarding two aspects of this particular fit: first the variation between results, explained to the different test cases, of course, but also I have some concerns about the variable x. In the first case, it is just an iteration cycle, when each cycle not only accumulates to the previous effects but also vary on the applied stress. I understand why this is done, but it brings me to the second aspect: the function itself. Why choosing the exponential of a 2nd degree polynomial? Does it have any physical significance? I doubt it due to the nature of the x variable. For instance a quick MATLAB fit gives these results with a completely different exponential function (the default used) General model Exp1: f(x) = a*exp(b*x) Coefficients (with 95% confidence bounds): a = 0.04105 (0.01666, 0.06544) b = 0.5499 (0.4876, 0.6121) Goodness of fit: SSE: 0.3093 R-square: 0.9959 Adjusted R-square: 0.9951 RMSE: 0.2487 That is why I asked, but it is not a major concern anyway. I am sure the authors have a good reason for choosing this function, just suggested they might want to explain it. 3- About the real-time application the author's response states that the information is obtained during the vibration cycle. Well, I was confused because in lines 173-174 and table 1 it seems to indicate they are acquired *after* the vibration cycle. But anyway as I could not find the acquisition speed of the 5 frame set, I wondered if, for instance, high frequency vibrations could not alter the measurements significantly, as usually is the case in these techniques. But I understand the research is not yet at	1. Thank you, I tried again to make clearer the aim by adding few more sentences in the abstract. 2. Thank you for your thorough reading and care to the article findings. We found this function as more appropriate to the obtained data or most of the obtained data. If the reviewer suggests putting more trials as the one presented in the comments we can accept the comment. But we had to choose on basis of best data fitting. As physical mechanisms are concerned for iteration an explanation could be the bifurcation process as seen on data; caused when the deposited energy is higher than the cohesion energy; so according to this first data there is an indication of crack doubling, by accepting it we concluded the exponential function fitting not only to data points but to the physical mechanism as well. However, since this theoretical acceptance is not proven yet experimentally and remains only an indication to approximate a theoretical behavior, we can also remove the graphical representations and the equations without removing the "concept" of exponential growth. Hence I accept a third revision if the reviewer thinks that could benefit the paper. 3. Lines 170-171 explain the before and after. It is not the vibration load but the surface alteration that is measured before and after the induced ΔT on surface temperature. This is a reference state to capture fringe generation by existing known defects prior to vibration loading. So we have first a reference evaluation and then we start the loading which is measured during the simulation process that is recorded at each and any vibration cycle. But you are right is not clear enough; I tried to clarify it better. In regards to the acquisition speed the limit is practical not theoretical. It is an algorithm driven by a pc and takes 5 records with pi/2 difference so the sooner the detector can record the fastest the image is recorded. However after each set of images there is an interval -again practical limitation of the frame grabber-. These practical limitations are implied in all techniques depended on digital detectors - so pixel intensity depended- and frame grabbers and processors. In our detector the frame acquisition is max 15 frames/sec. The technical details of the system are considered out of the scope of the paper which is to highlight the potential of crack detection before it becomes visible on the surface. The technique can be affected by low vibration noise but due to phase shifted 5-set algorithm the effect is not crucial as in other phase shifted techniques. 4. Corrected. 5. Thank you for your advice and help.

this point. I was just curious. **4- I found what seem to be some small typos the authors may want to correct. In line 94, for instance, I guess the authors mean ½ lambda of the laser wavelength, not lambda. Also in figure 1 Uo and Ur do not appear as such on the schema (o and U), and what L is, is not specified. In figure 8 the legend marks one curve as B (which is not given, but is clearly the number of generated cracks) and "Polynomial Fit of Book4_B", which I don't know what it is.** **5- English grammar and writing has been improved, but I'd advise that a native speaker checks the paper for mistakes and some sentence re-writing for clarity.**	