**Editorial comments:**  
The manuscript has been modified by the Science Editor to comply with the JoVE formatting standard. Please maintain the current formatting throughout the manuscript. The updated manuscript (55318\_R0\_080816.docx) is located in your Editorial Manager account. In the revised PDF submission, there is a hyperlink for downloading the .docx file. Please download the .docx file and use this updated version for any future revisions.  
  
Changes to be made by the Author(s):  
1. Please take this opportunity to thoroughly proofread the manuscript to ensure that there are no spelling or grammar issues. The JoVE editor will not copy-edit your manuscript and any errors in the submitted revision may be present in the published version.  
  
2. Please abbreviate all journal titles.  
  
3. Please define all abbreviations before use.  
  
4. Please combine some of the shorter Protocol steps so that individual steps contain 2-3 actions and maximum of 4 sentences per step.  
  
5. Please reduce the current highlighting of the protocol text for the video to be 275 pages or less to ensure that the videography can occur in a single day.  
  
6. Please make Figures 7-14 supplementary Figures with the numbering beginning from 1: Supplementary Figure 1, etc.  
  
7. Please include a title and a description of each figure and/or table. All figures and/or tables showing data must include measurement definitions, scale bars, and error bars (if applicable).  
  
8. As we are a methods journal, please revise the Discussion to explicitly cover the following in detail in 3-6 paragraphs. Please include citations.  
a) Critical steps within the protocol  
b) Any modifications and troubleshooting of the technique  
c) Any limitations of the technique  
d) The significance with respect to existing methods  
e) Any future applications of the technique  
  
9. Additional detail is required: Section 5 – How are these measurements performed? Please cite manufacturer’s instructions or describe all of the actions.  
  
10. Branding: Ares G2 – Figure 1  
  
11. Discussion: Please discuss the significance with respect to alternative methods (including what the alternative methods are) and any modifications/troubleshooting that can be performed.  
  
12. Grammar:  
-7.6 – Please use imperative tense or convert to a note.  
-Discussion – “with improvements upcoming software changes”

**Reviewers' comments:**  
**Reviewer #1:**  
*Manuscript Summary:*  
Accept.  
  
*Major Concerns:*  
N/A  
  
*Minor Concerns:*  
N/A  
  
*Additional Comments to Authors:*  
N/A

**Reviewer #2:**  
*Manuscript Summary:*  
Overall, a very elegant technique and worthy of publication after revision. The discussion should include more information about the data in Figure 6. Do the measurements confirm other binary techniques: dielectric rheology and rheo-SANS? I really think this question is central to the need and novelty of this  
measurement. With showing a proof of principle, comparing to the simpler techniques is paramount.  
  
*Major Concerns:*  
N/A  
  
*Minor Concerns:*  
N/A  
  
*Additional Comments to Authors:*  
Page: 3  
The long abstract could include more details on how the rheology and dielectric responses change with shear. Do the properties increase/decrease by what percent?

**We agree and have modified the abstract to be more specific about the electrical response.**

Page: 4  
The abstract is sound. The final two paragraphs could be more focused and shorter.  
Page: 6  
Fig 3d could be better labeled to show where the sample goes and how the torqeue is applied and how the dielelectric stimulus and response are delivered and measured. What materials do the neutrons go through in their path shown in Fig 4 upper left?

**We have added an additional e.) to reflect this comment.**

Page: 8  
Steps 6 and 7 could used figures.

**Steps 6 & 7 will be included in the video so we did not see it necessary to detail how the cables were connected.**

Page: 11  
Having a method to sync the three sets of data is very helpful.  
The discuss of Figure 5a is quite incomplete. Any reader can see what is plotted on the y and x axis. What trends were measured and what shear conditions were overlaid? How long does it take to measure the data shown? The blue and green data point are much too small on the far right figure.  
An example calculation for converting fractal aggregates to hard sphere volume fraction would be helpful. What is the volume fraction for the data shown in 5b?

**The reviewer’s questions are addressed in the figure caption.**

Page: 12  
Fig 6 is much too busy. Plot either stress or viscosity, not both and carry this idea to the blue and red also.  
**We agree with the reviewer and have removed the viscosity from Figure 6.**

**Reviewer #3:**  
*Manuscript Summary:*  
The authors report on a Couette cell with simultaneous rheological and dielectrical spectroscopy detection for use in a SANS instrument at NIST.  
The technique is well described and the manuscript is worth publishing. However there are som concerns worth mentioning that should be addressed before publications.  
  
*Major Concerns:*  
1. Synchtron sources and X-ray techniques are not mentioned. There has been several aet-ups for bot rheology and dielectric spectroscopy at SAXS beamlines. The authors should mention this and make sure that none such combined set-ups have already been implemented with SAXS.

**Alternative methods were explicitly discussed in the introduction. However, after a thorough literature review we were unable to identify any examples of simultaneous rheo-dielectric geometries capable of SANS/SAXS measurement.**

2. The optimal gaps for a rheological and BDS experiments are completely different. The BDS signal would be better at small gaps (typically 0.1 mm), while for rheology 1-2 mm is typically used and small gaps are difficult to achieve.

**Gap thickness is not the largest limitation from a rheology/dielectric spectroscopy perspective.**

What options are foreseen and what are the limitations posed by the set-up? Can "real " dielectrical relaxations be followed or only slow conductivity processes?

**Limitations for the real dielectric response primarily stem from the frequency range, electrode polarization and inductance. All of these are comparable with other rheolectric measurements**

3. Can the BDS and rheology data be normalised to absolute units? And the SANS data? How?  
**The data is in absolute scale as discussed in the text.**

*Minor Concerns:*  
The resolution of the pictures can be improved.  
  
*Additional Comments to Authors:*  
N/A