

After revising and uploading your submission, please also upload a separate rebuttal document that addresses each of the editorial and peer review comments individually. Please submit each figure as a vector image file to ensure high resolution throughout production: (.psd, ai, .eps., .svg). Please ensure that the image is 1920 x 1080 pixels or 300 dpi. Additionally, please upload tables as .xlsx files.

*The figures and table have been submitted per JoVE format recommendations.*

### **Editorial comments:**

Changes to be made by the author(s) regarding the manuscript:

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.

*The manuscript has been reviewed for spelling and grammar issues.*

2. Please number the figures in the sequence in which you refer to them in the manuscript text.

*The figure numbering has been updated.*

3. References: Please use the JoVE EndNote style file and ensure that the references appear as the following: [Lastname, F.I., Lastname, F.I., Lastname, F.I. Article Title. Source. Volume (Issue), FirstPage – LastPage (YEAR).] For more than 6 authors, list only the first author then et al. Please do not abbreviate journal titles. See the example below:

Bedford, C.D., Harris, R.N., Howd, R.A., Goff, D.A., Koolpe, G.A. Quaternary salts of 2-[(hydroxyimino)methyl]imidazole. Journal of Medicinal Chemistry. 32 (2), 493-503 (1998).

*The references have been updated per JoVE guidelines.*

### **Reviewers' comments:**

#### **Reviewer #1:**

Manuscript Summary:

I'd like to thank the authors for including almost all suggested changes. The manuscript, especially the technological protocol benefits from this.

Minor Concerns:

There are few comments from my side:

-In the revised version, Figure 2 still lacks important information, i.e. axes with description and information on the boundary condition of the measurement.

*The caption for figure 2 has been updated with more information regarding the measurement.*

-Line 24-26: Please provide evidence, of the higher efficiency of these devices "in terms of flow rate per power input, than those that rely on Rayleigh waves and other modes of vibration in LN or PZT", taking account a well comparable droplet size distribution. If no evidence is provided, I suggest to soften the statement to "Such devices may be able to atomize liquid more efficiently..."

*The evidence for this claim—notably the figure of merit and data that indicate a substantially greater atomization flow for a given input power—is detailed in the publication cited in the second paragraph of the introduction, where we make the same claim as in the abstract. We cannot include the citation in the abstract but have provided it in the introduction and have included it below for the reviewer's consideration.*

*Collignon, Sean, Ofer Manor, and James Friend. "Improving and Predicting Fluid Atomization via Hysteresis-Free Thickness Vibration of Lithium Niobate." Advanced Functional Materials 28.8 (2018): 1704359.*

#### **Reviewer #2:**

The authors have made comprehensive alterations to the manuscript which adequately address all the points I raised in the initial review. I think this is a useful and well described protocol and ready for publication.

*We are grateful to the reviewer for their comments and questions for the previous version, as this version is much improved as a consequence.*

#### **Reviewer #3:**

Manuscript Summary:

The subject of the manuscript is interesting, however the title and the abstract cant inform to the reader the real scope of the work.

Major Concerns:

- a) Change the title. use una more indicative of the scope. You are constructing and characterising a ultrasonic atomization system.. not a thickness mode transducer
- b) The same for the summary and the abstract

*The example is an atomizer, but the process of fabrication and testing, altogether four of the five steps, describe the work to fabricate and characterize a thickness-mode transducer. The atomizer is one of many possible applications of this simple structure, and the point of the*

*protocol is to fabricate and characterize the resonator devices for this broader range of acoustofluidic applications. Atomization is just one of them, a convenient example for our purposes. Thus the title, summary, and abstract as provided. However, our introduction begins and finishes with a discussion of atomization, and so we have added “Atomization and Acoustofluidics” to the title in recognition of this concern.*

Minor Concerns:

c) Why don't you buy the crystals with electrodes?

*They're not commercially available except in very large batch quantities. Lead zirconate transducers are widely available, but these are not single crystal and quite inefficient by comparison.*

*Further, the electrode thickness and quality directly affect the transducer efficiency for acoustofluidics. We have developed and characterized these parameters in order to lower power consumption by the device for the specific case during atomization.*

d) delete the comment about the high speed camera. You can only declare the procedure used by you...

*We're unsure what this is referring to, as the text describing the use of high speed cameras is present in several locations in the manuscript. In fact, high-speed imaging is crucial to understanding most acoustofluidic phenomena, whether by us or by a prospective reader, and in making this point we have added a brief statement to the text on line 69, “In atomization, like many other acoustofluidic phenomena,...”*

c) the text in line 75 is very descriptive. I suggest to include in the abstract or in the summary

*We have revised the abstract slightly to highlight the point that fluid control is important in atomization.*