TEGUH FIRMANSYAH <teguh.firmansyah81@ui.ac.id>

Your Submission

1 pesan

Ernst van Faassen <em@editorialmanager.com> 2 Agustus 2021 pukul 19.16
Balas Ke: Ernst van Faassen <vanfaassen.apsusc@gmail.com>
Kepada: Teguh Firmansyah <teguh.firmansyah81@ui.ac.id>

Ms. Ref. No.: APSUSC-D-21-06298
Title: Asymmetric plasmon hybridization induced by shear horizontal vibrations for reconfigurable localized surface plasmon resonance spectra
Applied Surface Science

Dear Mr Teguh Firmansyah,

Reviewers have now commented on your paper. You will see that they are advising that you revise your manuscript. If you are prepared to undertake the work required, I would be pleased to reconsider my decision.

For your guidance, reviewers' comments are appended below.

If you decide to revise the work, please submit a list of changes or a rebuttal against each point which is being raised when you submit the revised manuscript.

Please also clearly mark your changes, deletions and additions in the revised manuscript (e.g. by color or underlining).

Editable files (e.g., Word, LaTeX) are required to typeset your article for final publication.

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Yours sincerely,

Ernst van Faassen
Editor
Applied Surface Science

Reviewers' comments:

Reviewer #3: MAJOR OBSERFVATIONS:

1) The authors talk in the introduction about hybrid antibonding and bonding modes. These are typically found in vertically stacked MIM structures [https://doi.org/10.1002/smll.200600409, https://doi.org/10.1021/acs.nanolett.8b04841, https://doi.org/10.1007/s12274-018-1974-3]. In the case of planar arrays of single dipoles there are no bonding or antibonding modes, or hybridization. You are just modulating the near-field coupling between the single dipoles and you don't observe two separate, coexisting hybrid modes, but just possibly a red-shift or blue-shift of the resonance dependent on the incident field polarization (with unpolarized light you could see two modes in nanorods for example but they are not hybrid modes, just the long and short axis modes of the rod). I invite the authors to the paragraph 5.5 of S. Maier's book "Plasmonics: Fundamentals and Applications" (10.1007/0-387-37825-1). With very ordered single particle arrays you can have surface lattice
resonances for example but that's not your case (at least for what concerns the experiment where you have a pretty disordered system).

I think that the term such as bonding and hybridization are confusing and misleading and should be corrected with the terms used in literature.

2) You start you article with a e very lengthy theoretical dissertation on shear horizontal waves, and that's ok but the intuitive picture is elusive. I think you should better clarify why you chose RF frequency to drive your piezoelectric material and comment also the possible effect of different driving frequencies along with the voltage parameter. For example Also a DC voltage I presume can distor the lattice. Also you should give a more clear intuitivie explanation to why having a periodic modulation leads to a different "steady state" interparlicle distance that you can detect as a new, different spectra). I don't't' think that's very intuitive for the average reader. Than you conclude chapter 2 commenting on other other theoretical aspects introducing a lot of textbook plasmonic equations and then introducing your simulation which leads to the other main issue I have with the paper.

3) There is too much confusion between experiment and theoretical models/simulations. You should first describe clearly your experimental results. I think your figure 1 is emblematic. You report theoretical simulations in a way which is not so clear as the first impact for the reader. I suggest modifying the figures such as figure 2 and figure 3 are the first thing you show (figure 3 can become figure 1 with the nice sketch of the system and figure 2 with the morphological characterization can follow, for example. Then the chapter about your simulation and models can be presented as the whole different thing that is.

MINOR OBSERVATIONS:

Several questionable terms are used in my opinions such as:

4) e-feld plasmonic (possible alternative: plasmonic enhanced near field)

5) SH-SAWs in key words: I would use the extended version, I don't know how many people know what this acronym means at a first look)

6) Derivative Configurations: What is the meaning of "derivative"? Not so clear

7) Things such as "SEM strong lighting": very vague, what does strong means?

8) Fig1 panel B should have wavelength units on the axis

9) TOC figure: different "cases" are not clear what they are, again I would remodulate the figure giving more importance to the experiment.

10) "a reconfigurable LSPR spectrum": a device which allows the dynamic modulation of the lspr. In the introduction you mix references which tune the LSPR during the fabrication and thus have static resonances to references which claim to change the LSPR post-fabrication, by for example strethching a PDMS template.

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TEGUH FIRMANSYAH <teguh.firmansyah81@ui.ac.id>

Editor handles APSUSC-D-21-06298R1

1 pesan

Applied Surface Science <em@editorialmanager.com> 10 September 2021 pukul 20.35
Balas Ke: Applied Surface Science <support@elsevier.com>
Kepada: Teguh Firmansyah <teguh.firmansyah81@ui.ac.id>

Ms. Ref. No.: APSUSC-D-21-06298R1
Title: Reconfigurable localized surface plasmon resonance spectrum based on acousto-dynamic coupling in arrays gold nanoparticles induced by shear horizontal vibration
Applied Surface Science

Dear Mr Teguh Firmansyah,

Your submission entitled "Reconfigurable localized surface plasmon resonance spectrum based on acousto-dynamic coupling in arrays gold nanoparticles induced by shear horizontal vibration" will be handled by Editor Ernst van Faassen.

You may check on the progress of your paper by logging on to the Editorial Manager as an author. The URL is https://www.editorialmanager.com/apsusc/.

Your username is: teguh2020
If you need to retrieve password details, please go to: https://www.editorialmanager.com/apsusc/l.asp?i=2006604&l=WFXPFAEK

Thank you for submitting your work to this journal.

Kind regards,

Editorial Manager
Applied Surface Science

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TEGUH FIRMANSYAH <teguh.firmansyah81@ui.ac.id>

Progress Update for your submission (APSUSC-D-21-06298R1) to Applied Surface Science

1 pesan

Ernst van Faassen <em@editorialmanager.com> 11 September 2021 pukul 16.43
Balas Ke: Ernst van Faassen <vanfaassen.apsusc@gmail.com>
Kepada: Teguh Firmansyah <teguh.firmansyah81@ui.ac.id>

Ms. Ref. No.: APSUSC-D-21-06298R1
Title: Reconfigurable localized surface plasmon resonance spectrum based on acousto-dynamic coupling in arrays gold nanoparticles induced by shear horizontal vibration
Applied Surface Science

Dear Mr Firmansyah,

We are pleased to inform you that a reviewer has agreed to review your manuscript APSUSC-D-21-06298R1

Please note that in most cases at least two reviews may be required before a decision on a manuscript is made. Please also note that the length of the review process can vary greatly between manuscripts. Therefore, we appreciate your patience in this regard.

To track the progress of your manuscript, please log in to https://www.editorialmanager.com/apsusc/ and click on the "Submissions Being Processed" folder.

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To: Editor in Chief: Applied Surface Science September 10, 2021
Prof. Henrik Rudolph
Prof. Ernst van Faassen (Editor in handling)

Re: Response to reviewers

Dear Professors,

I hope this email finds you well and healthy. First of all, we want to thank you for evaluating and allowing us an opportunity to address the reviewers' comments.

We have carefully revised the manuscript, according to the reviewers' comments. We are uploading:

1) Cover Letter
2) Highlights (for review)
3) Graphical Abstract (for review)
4) Response to Reviewers
5) Manuscript
6) **Revised** Manuscript with Marked changes (with **yellow highlights**)
7) **Revised** manuscript (unmarked)
8) Credit Author Statement
9) Declaration of Interest Statement
10) Table and Figure
11) Supplementary material

We agree with the reviewer's suggestion to reroute and refocus the paper to make a more precise discussion. Therefore, we also revise the title of the manuscript.

Revised title: Reconfigurable localized surface plasmon resonance spectrum based on acousto-dynamic coupling in arrays gold nanoparticles induced by shear horizontal vibration

Moreover, we also provide **new additional data/figures** to enrich the discussion of the paper. The new additional data can be seen in **Figures.** 1(b-c), 2(a-e), 3(d-f), 5(a, c-h), 6(d), 7(e), and 8(a-c) for the main manuscript then **Figures.** S2(a-f) and S4(c) for the supplementary material.

Once again, we thank you for the valuable time you put into reviewing and evaluating our paper. Please do not hesitate to contact me if there are any questions.

Sincerely Yours,
Teguh Firmansyah and Jun Kondoh
Shizuoka University, Japan.

Email:
teguh.firmansyah81@ui.ac.id
kondoh.jun@shizuoka.ac.jp

Journal : Applied Surface Science
Manuscript ID : APSUSC-D-21-06298R1
Title : Asymmetric plasmon hybridization induced by shear horizontal vibrations for reconfigurable localized surface plasmon resonance spectra
Revised Title : Reconfigurable localized surface plasmon resonance spectrum based on acousto-dynamic coupling in arrays gold nanoparticles induced by shear horizontal vibration

Response Letter

Journal : Applied Surface Science
Manuscript ID : APSUSC-D-21-06298R1
Title : Asymmetric plasmon hybridization induced by shear horizontal vibrations for reconfigurable localized surface plasmon resonance spectra
Revised Title : Reconfigurable localized surface plasmon resonance spectrum based on acousto-dynamic coupling in arrays gold nanoparticles induced by shear horizontal vibration
Author(s) : Teguh Firmansyah, Gunawan Wibisono, Eko Tjipto Rahardjo, and Jun Kondoh

First of all, we would like to thank the reviewers for their in-depth and constructive reviews of our manuscript and the editor for his careful reading and suggestion to resubmit our manuscript. In this revised version of the manuscript, we did our best to address all comments raised by the reviewers. A detailed item-by-item responses to each of the reviewers' points are presented below.

Responses to reviewers' comments

Major observations

Concern # No. 1:
The authors talk in the introduction about hybrid antibonding and bonding modes. These are typically found in vertically stacked MIM structures [https://doi.org/10.1002/smll.200600409, https://doi.org/10.1021/acs.nanolett.8b04841, https://doi.org/10.1007/s12274-018-1974-3]. In the case of planar arrays of single dipoles there are no bonding or antibonding modes, or hybridization. You are just modulating the near-field coupling between the single dipoles and you don't observe two separate, coexisting hybrid modes, but just possibly a red-shift or blue-shift of the resonance dependent on the incident field polarization (with unpolarized light you could see two modes in nanorods for example but they are not hybrid modes, just the long and short axis modes of the rod). I invite the authors to the paragraph 5.5 of S. Maier's book "Plasmonic: Fundamentals and Applications" (10.1007/0-387-37825-1). With very ordered single particle arrays you can have surface lattice resonances for example but that's not your case (at least for what concerns the experiment where you have a pretty disordered system). I think that the term such as bonding and hybridization are confusing and misleading and should be corrected with the terms used in literature.

Author response: Many thanks to the reviewer for this fruitful feedback and insightful suggestion. Especially, thank you very much for suggesting very interesting references. We have read and studied it thoroughly. Therefore, we agree with the reviewer's suggestion to refocus the paper to make a more precise discussion. We also agree to correct the term of hybrid antibonding and bonding modes in our manuscript. In detail, we have refocused the explanation of our paper to acousto-dynamic of near-field coupling of LSPR. Hence, we have revised the title of the manuscript.

Revised title: Reconfigurable localized surface plasmon resonance spectrum based on acousto-dynamic coupling in arrays gold nanoparticles induced by shear horizontal vibration

Besides the title, we also revise the abstract, introduction, and paper route. Moreover, the extended explanation of the abstract for a reply to the reviewer reads as follows.

Reconfigurable localized surface plasmon resonance (LSPR) is an essential characteristic for various applications to support Society 5.0. However, many LSPR spectrum have poor reconfigurability. As a novelty, we proposed a reconfigurable LSPR spectrum by acousto-dynamic coupling in arrays of gold nanoparticles (AuNPs) induced by shear-horizontal vibrations. The vibrations were produced by piezoelectric phenomena especially shear horizontal surface acoustic waves (SH-SAWs) on a 36XY-$LiTaO_3$ substrate after applying an electric signal, the ON-condition. The experimental results demonstrated that the ON-condition produced a blueshift effect on the peak position (λ_P) with an adjustment quality factor compared to the OFF condition. Moreover, in order to perform the finite-difference time-domain (FDTD) analysis, we reproduced the morphological structure of AuNPs on the 36XY-$LiTaO_3$ substrate base on scanning electron microscope (SEM) images. In details, the morphological structure structures were separated into three classifications such as; identical dimer AuNPs, nonidentical dimer AuNPs, and arrays AuNPs structure. Then, the initial AuNPs structure was used as an OFF-condition. Furthermore, the different coupling distances and different arrays structures were utilized as ON-condition approaches for dimer AuNPs and arrays AuNPs, respectively. The FDTD simulation obtained a blueshift effect compare to the initial structure. Finally, the proposed structure successfully combines piezoelectric phenomena with plasmonic phenomena to produce reconfigurable LSPR. The LSPR spectrum can be switched comfortably and reverses easily. Finally, the proposed method can be applied for multifunctional sensors with the high possibility of integration into a wireless network.

Regarding the pretty disordered system condition, we thank the reviewer for pointing this out. We agree with the reviewer's opinion. Therefore, we also have revised our AuNPs morphological structure for simulation purposes.

To perform the finite-difference time-domain (FDTD) analysis, we reproduced the morphological structure of AuNPs on the 36XY-$LiTaO_3$ substrate based on SEM images, as shown in **Figures 5(a-h).** In detail, the structures were separated into three classifications such as; identical dimer AuNPs, nonidentical dimer AuNPs, and arrays AuNPs structure.

However, we made an exception for arrays AuNPs structure. For the arrays AuNPs structure, the configuration was separated into two architectures such as symmetric/asymmetric structure and reproducing SEM morphological structure. The symmetric/asymmetric was used to see the behavior in ordered (symmetric) / disordered (asymmetric) of AuNPs configuration. It was only focusing on simulation data without fabrication, as shown in **Figures 7(a-e).** Moreover, the second arrays simulation is developed base on real arrays AuNPs scheme that reproduced from SEM morphological data in **Figures 5(e) and 5(h).** The results are shown in **Figures 8(a-c).**

Regarding the paper route, we agree with the reviewer. We have prioritized the experiment, including the effect of a different driving electric input signal. Then, it followed by FDTD simulation with the AuNPs structure was reproduced from SEM morphological structure.

Furthermore, we also provide new additional data/figures to enrich the discussion of the paper. The new additional data can be seen in **Figs.** 1(b-c), 2(a-e), 3(d-f), 5(a, c-h), 6(d), 7(e), and 8(a-c) for the main manuscript then **Figs.** S2(a-f) and S4(c) for the supplementary material.

Author action: We updated the manuscript by the yellow highlighted as shown on lines 1 (title), lines 29, lines 107, lines 126, lines 238, lines 304, lines 354, and lines 396.

Concern # No. 2:

You start your article with a very lengthy theoretical dissertation on shear horizontal waves, and that's ok but the intuitive picture is elusive. I think you should better clarify why you chose RF frequency to drive your piezoelectric material and comment also the possible effect of different driving frequencies along with the voltage parameter. For example, also a DC voltage I presume can distort the lattice. Also, you should give a clearer intuitive explanation to why having a periodic modulation leads to a different "steady state" interparticle distance that you can detect as a new, different spectra). I don't't' think that's very intuitive for the average reader. Than you conclude chapter 2 commenting on other theoretical aspects introducing a lot of textbook plasmonic equations and then introducing your simulation which leads to the other main issue I have with the paper.

Author response: Thank you very much for the in-depth review. As a reviewer suggested, we have removed several unnecessary theoretical/equation dissertations on shear horizontal waves. Then, we have compressed it to the single important equation that was written at main the text. The equation essentials to explain the shear waves excitation on the proposed device structure, as shown in **Figure 1(d).**

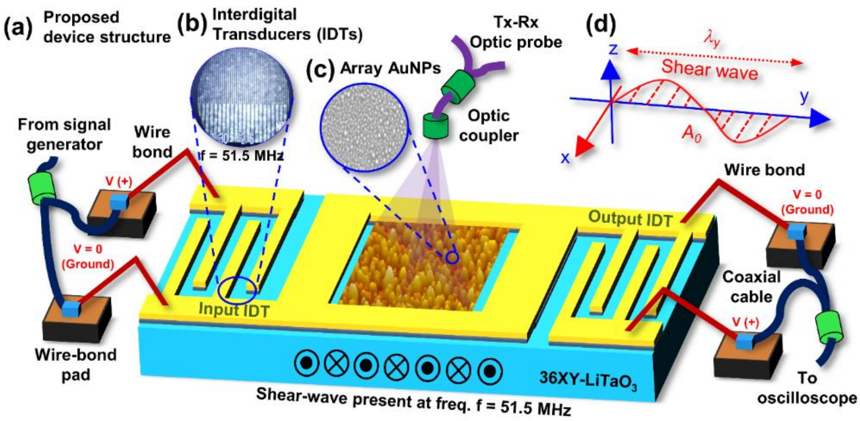


Figure 1. (a) A proposed device structure of reconfigurable LSPR spectra based on acousto-dynamic coupling array AuNPs induced by shear horizontal vibration, (b) Interdigital transducers (IDTs) is designed at frequency of 51.5 MHz, (c) 2D-SEM image of array AuNPs on the propagation surface of SH-SAW, (d) the shear horizontal surface acoustic waves (SH-SAWs) excited on a 36XY-$LiTaO_3$ substrate after applying an electric signal via interdigital transducers (IDTs).

SH-SAWs were generated from the IDT by applying an electric signal. **Figure 1(d)** shows the coordinate system of particle displacement from the piezoelectric effect for the surface shear wave condition which is follow the wave equation. It is given by $U_x(y,z,t) = A_0\, e^{-\beta_s y}\cos(\omega t - k_{sr}y)$, where $U_x(y,z,t)$ denotes the displacements in the *x*- and *z*-directions, A_0 is the maximum amplitude of the $U_x(y,z,t)$ displacement in the *x*-direction, β_s is the damping coefficient in the *y*-direction, $\omega = 2\pi f$ rad/s, *t* denotes the time, and k_{sr} is the real wavenumber. These waves propagate along the *y*-direction with wavelength λ_y, which is determined by $\lambda_y = 2\pi/k_{sr}$. Several notes can be elucidated such as the value of A_0 depends on the applied input voltage, and the oscillation frequency depends on the frequency of the input voltage. Therefore, we can control the shear surface wave $U_x(y,z,t)$ by controlling the input voltage and working frequency with an appropriate IDT structure.

Regarding the clearer intuitive explanation and why having a periodic modulation leads to a different "steady-state" interparticle distance that can detect as a new, different spectrum).

As suggested by the reviewer. We have added new images to explain the procedure, as shown in **Figures 2(a-e).** We can see that the presence of a shear wave leads to a different position of interparticle distance. We name it acousto-dynamic due to dynamic vibration on arrays AuNPs. This condition leads to a different spectrum, as shown in **Figures 2(f).**

Moreover, the following part gives detail explanation of the procedure. **Figure 2(a)** shows an electric input signal from a signal generator with separated as OFF-condition and ON-condition (V_{P-P}). The OFF-condition has a value of V_{P-P} = 0 V, then the ON-condition has a sine wave shape with a value of V_{P-P} = 2 V and a frequency of 51.5 MHz. In other words, it has RF input signal. **Figure 2(b)** illustrates a side view of IDT with the electrical potential for OFF-condition. An OFF-condition is not excited the shear waves. Therefore, the arrays AuNPs have a static condition or not change, as shown in **Figure 2(c).** In contrast, **Figure 2(d)** shows the side view of IDT with the electrical potential for ON-condition. At ON-condition, the positive and negative potentials will appear alternately with the frequency of 51.5 MHz. Therefore, the shear-wave is excited. The appearance of the shear wave causes vibration of arrays AuNPs structure, as shown in **Figure 2(e)**. This state leads to different LSPR spectrum, as shown in **Figures 2(f).**

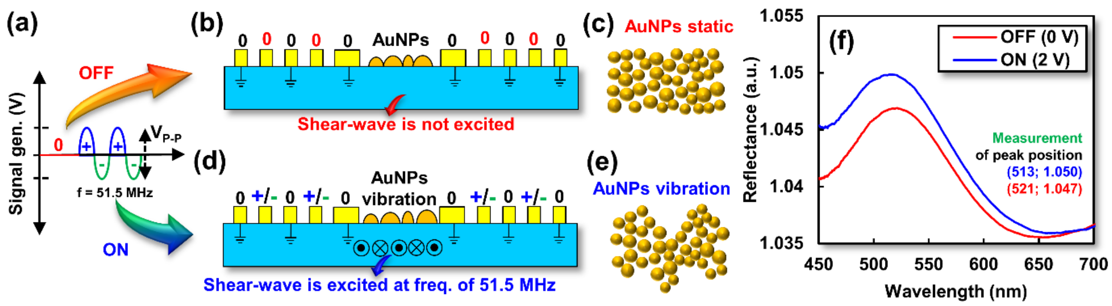


Figure 2. (a) Electric input signal from signal generator with OFF-condition and ON-condition (V_{P-P}) with frequency of 51.5 MHz, (b) side view of IDT with the electrical potential for OFF-condition, the shear-wave is not exciting, (c) array AuNPs structure for OFF-condition, (d) side view of IDT with the electrical potential for ON-condition, the shear-wave is exciting at

frequency of 51.5 MHz, (e) array AuNPs structure for ON-condition, (f) the reflectance of the LSPR spectrum at the OFF/ON-condition

Regarding clarify: Choosing RF frequency to drive piezoelectric material and the possible effect of different driving frequencies along with the voltage parameter and DC voltage. Then, the reviewer presumes it can distort the lattice.

Thank you very much for giving this suggestion. It would have been interesting to explore this aspect. Therefore, we have extended our experiment with these parameters such as the different frequencies, different voltages, and DC input. The results are shown in **Figures 3(d-f)** at the main text and **Figures S2(a-f)** at the supplementary material.

Here, it should be emphasised that we design the IDT structure to resonate at a frequency of 51.5 MHz. Therefore, an RF signal should be supplied with a frequency of 51.5 MHz to excite the shear wave vibration. **Figure 3(e)** shows the RF input signal at 51.5 MHz with voltage variation $V_{P\text{-}P}$ from 2V, 4V, 6V, 8V, and 10V. Then, **Figure 3(f)** illustrates the RF output signal. We can see that the output voltage has a high value with the same frequency as the input. Therefore, the measurement result was indicated that the piezoelectric phenomena occurred. Then, we can conclude that the shear-wave vibration excites successfully. If there is a different condition between the IDT design structure and the input signal, the shear wave will not be generated.

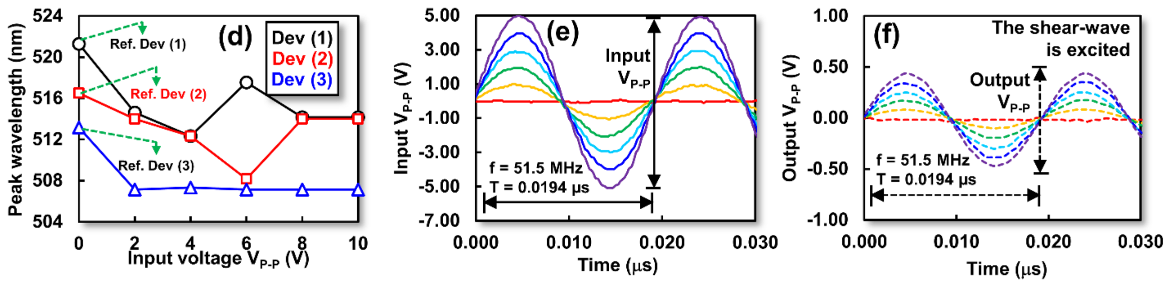


Figure 3. (d) the peak wavelength position with different input voltages for Dev (1), Dev (2), and Dev (3), (e) the RF input signal at frequency of 51.5 MHz with voltage variation of $V_{P\text{-}P}$ from 2V, 4V, 6V, 8V, and 10V, (f) the RF output signal at input frequency of 51.5 MHz.

Next part, we present the effect of the different driving electric input signals such as the lower frequency (36.5 MHz), higher frequency (66.5 MHz), and DC voltage with voltage variation $V_{P\text{-}P}$ from 2V, 4V, 6V, 8V, and 10V. The result is shown in **Figures S2(a-f).**

Figure S2(a) shows the RF input signal at 36.5 MHz with voltage variation VP-P from 2V to 10V. It should be noted that the RF input signal has a lower frequency than the IDTs operation. Then, the RF output signal is shown in **Figure S2(b).** In the opposite position, **Figure S2(c)** shows the RF input signal at 66.5 MHz, or it has a higher frequency than the IDTs operation. The output RF signal is shown in **Figure S2(d).** We can see that both RF input signals have high voltage values, as shown in **Figures S2(a)** and **S2(c).** However, the result indicates that both RF output signals have small voltage, as shown in **Figures S2(b)** and **S2(d).** This result is indicated that the share-waves vibration is not excited. This condition happened because the RF input signal frequency did not match with the IDT design structure. Besides, the function of IDTs as a resonator becomes ineffective. This circumstance will lead the piezoelectric crystal to the nonlinear condition. The nonlinear condition of piezoelectric occurs when electric field, strain, and dielectric responses become nonlinear [35,36]. Therefore, it is important to note that our research was focused on the linear condition of piezoelectric to make sure that the arrays AuNPs have vibration smoothly.

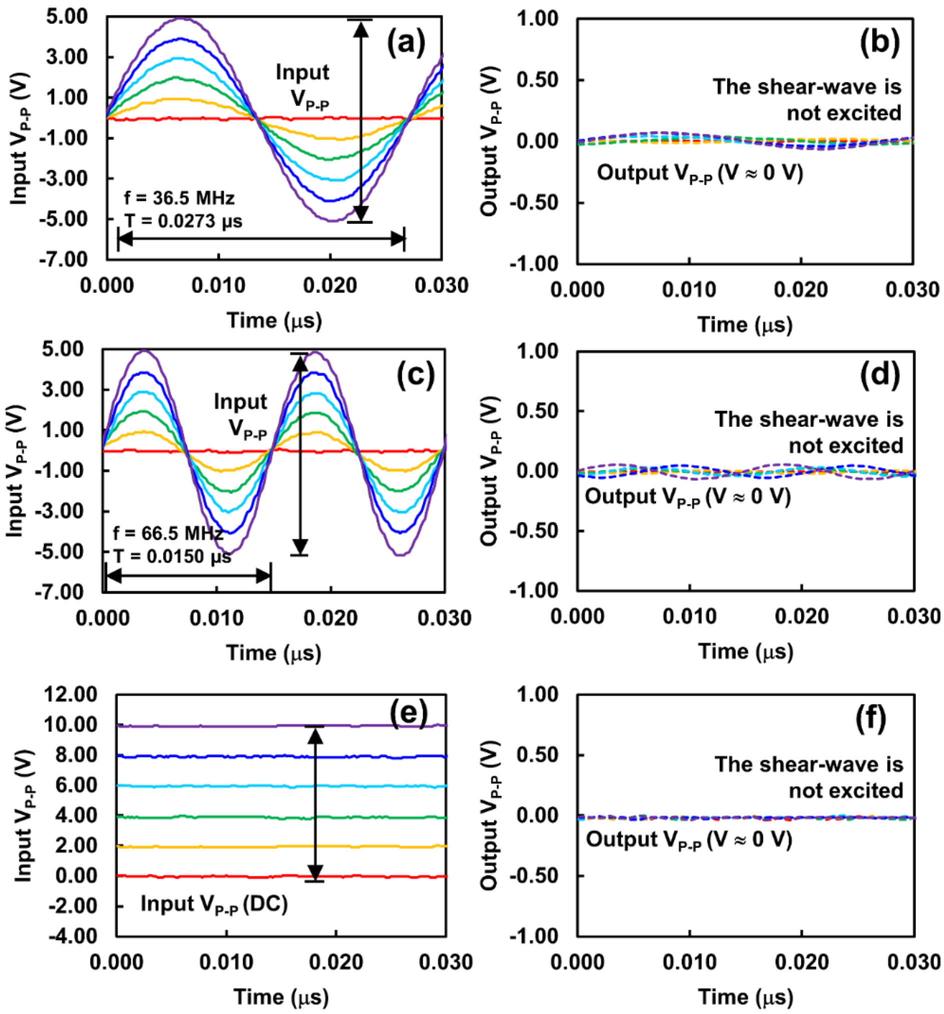


Figure S2. (a) the RF input signal at frequency of 36.5 MHz with voltage variation of V_{P-P} from 2V, 4V, 6V, 8V, and 10V, (b) the RF output signal, (c) the RF input signal at frequency of 66.5 MHz, (d) the RF output signal, (e) the DC input signal at frequency with voltage variation of V_{P-P} from 2V, 4V, 6V, 8V, and 10V, (f) the DC output signal **(This figure shows at supplementary material)**

Moreover, **Figure S2(e)** shows the DC input signal with V_{P-P} voltage from 2V, 4V, 6V, 8V, and 10V. Then, the DC output signal is shown in **Figure S2(f).** Similarly, the DC input signal leads to a tiny output signal. Therefore, the result indicates that the share-waves vibration is not excited. Implementing DC source as an input signal to IDTs structure could lead to another characteristic such as electrostriction phenomena which could distort the lattice. However, the electrostriction phenomena can be obtained by meeting essential parameters including high DC input voltage, high electric field, tiny coupling, and low dielectric permittivity [37,38]. Therefore, the DC input voltage is not useful for our proposed devices which use the piezoelectric phenomena. In addition, it also does not meet the criteria of electrostriction phenomena.

In brief, our proposed method is focused to make the shear-wave vibration excited. Thus, the acousto-dynamic coupling in arrays AuNPs can be produced to obtain a reconfigurable LSPR spectrum. The shear-wave vibration is obtained by a matching condition between the IDT frequency with RF input signal frequency. Furthermore, an input signal with the alternate polarity between positive and negative is also required. Consequently, the DC source as an input signal is not suitable for our proposed device structure.

Additional references:

[35] A. Albareda, R. Pérez, Non-linear behaviour of piezoelectric ceramics, Springer Ser. Mater. Sci. 140 (2011) 681–726. https://doi.org/10.1007/978-90-481-2875-4_15.

[36] D. Kim, Nonlinearity in piezoelectric ceramics, J. Mater. Sci. 6 (2002) 4575–4601.

[37] S. Santucci, V. Esposito, Electrostrictive Ceramics and Their Applications, Encycl. Mater. Tech. Ceram. Glas. (2021) 369–374. https://doi.org/10.1016/b978-0-12-803581-8.12071-5.

[38] R.E. Newnham, V. Sundar, R. Yimnirun, J. Su, Q.M. Zhang, Electrostriction: Nonlinear electromechanical coupling in solid dielectrics, J. Phys. Chem. B. 101 (1997) 10141–10150. https://doi.org/10.1021/jp971522c.

Author action: We updated the manuscript by the yellow highlighted as shown on lines 126, lines 149, lines 231, and **supplementary material page S3.**

Concern # No. 3:

There is too much confusion between experiment and theoretical models/simulations. You should first describe clearly your experimental results. I think your figure 1 is emblematic. You report theoretical simulations in a way which is not so clear as the first impact for the reader. I suggest modifying the figures such as figure 2 and figure 3 are the first thing you show (figure 3 can become figure 1 with the nice sketch of the system and figure 2 with the morphological characterization can follow, for example. Then the chapter about your simulation and models can be presented as the whole different thing that is.

Author response: Thank you very much for your comment. We agree with this suggestion. We have prioritized the experiment, including the effect of a different driving electric input signal. Then, we explain morphological characterization. Moreover, it followed by FDTD simulation with the AuNPs structure was reproduced from SEM morphological structure.

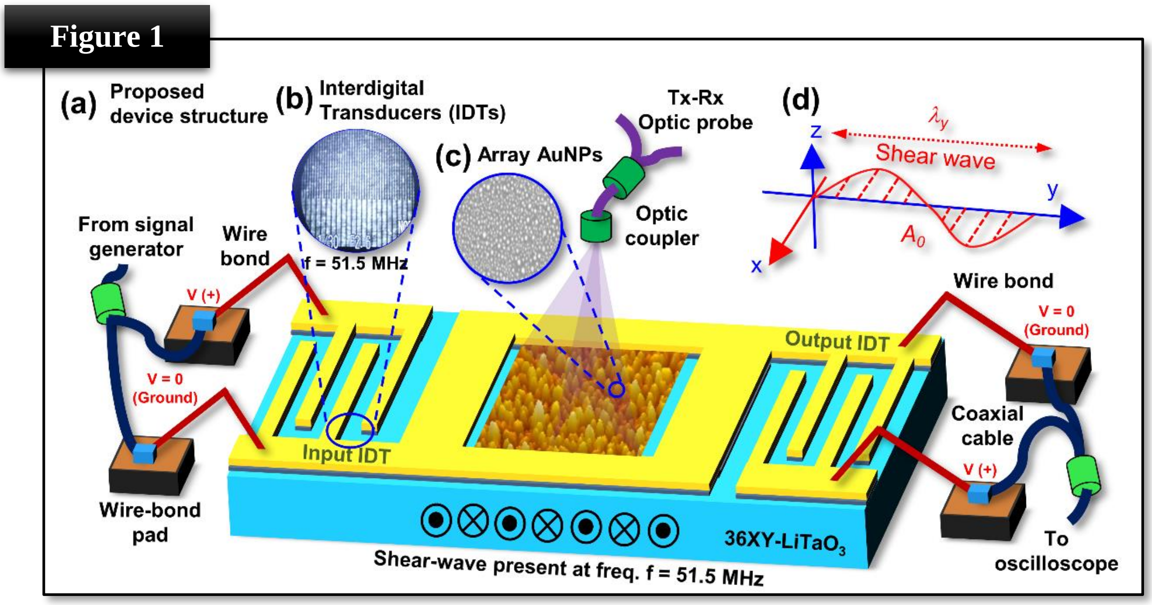
In detail, we have rearranged the paper structure as follows;

1. Introduction
2. Measurement of reconfigurable LSPR spectrum induced by shear horizontal vibration
    2.1 The surface acoustic waves (SAWs) mechanism in vibrating arrays AuNPs
    2.2 Measurement of reconfigurable LSPR spectrum
    2.3 The effect of different driving electric input signal

3. Fabrication and morphological characterization
   3.1 Fabrication of arrays AuNPs on 36XY-LiTaO3
   3.2 Morphological characterization
   3.3 Reproducing the morphological structure of the arrays AuNPs
4. FDTD computational analysis base on reproducing the morphological structure
   4.1 Reconfigurable LSPR of identical and nonidentical dimer AuNPs
   4.2 Reconfigurable LSPR of arrays AuNPs using symmetric/asymmetric structure and reproducing morphological structure
5. Conclusion

Regarding the suggestion modify the figures position.

Thank you very much for pointing this out. We agree with reviewer suggestion. Therefore, we have recomposed our figure structure as follows;



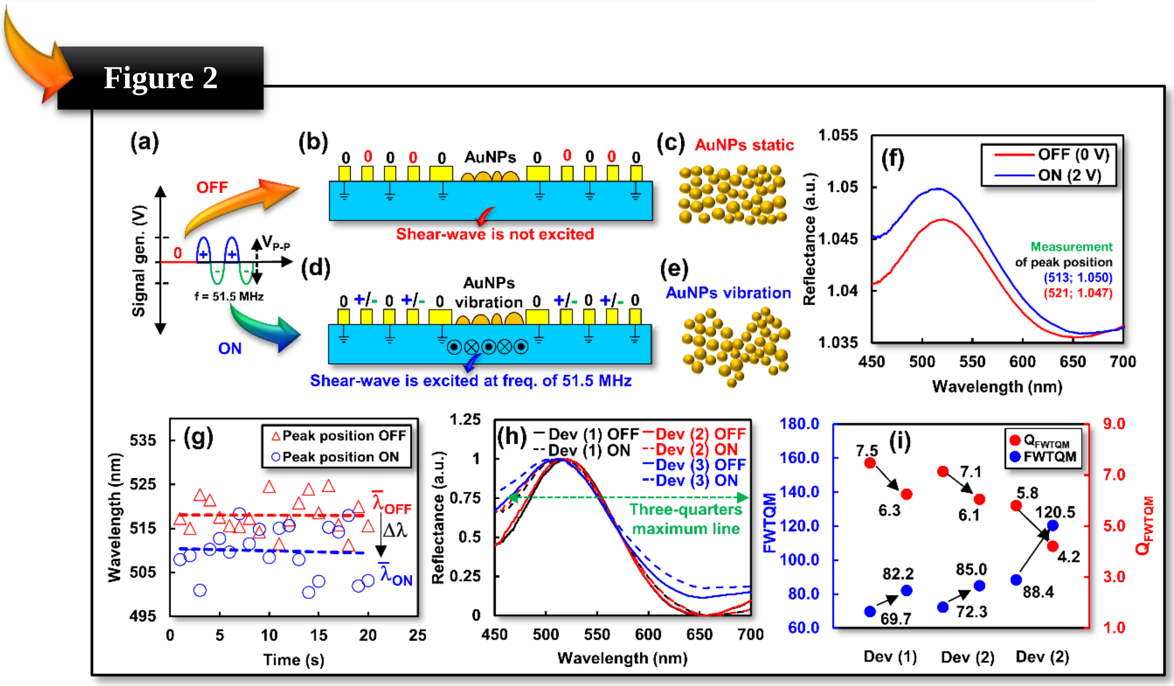


Figure 3

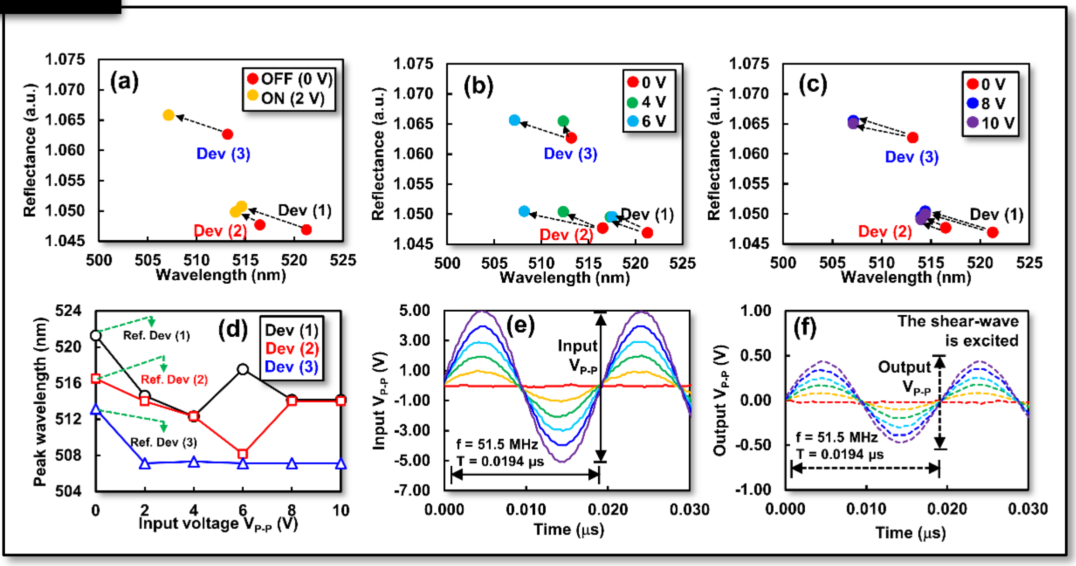


Figure 4

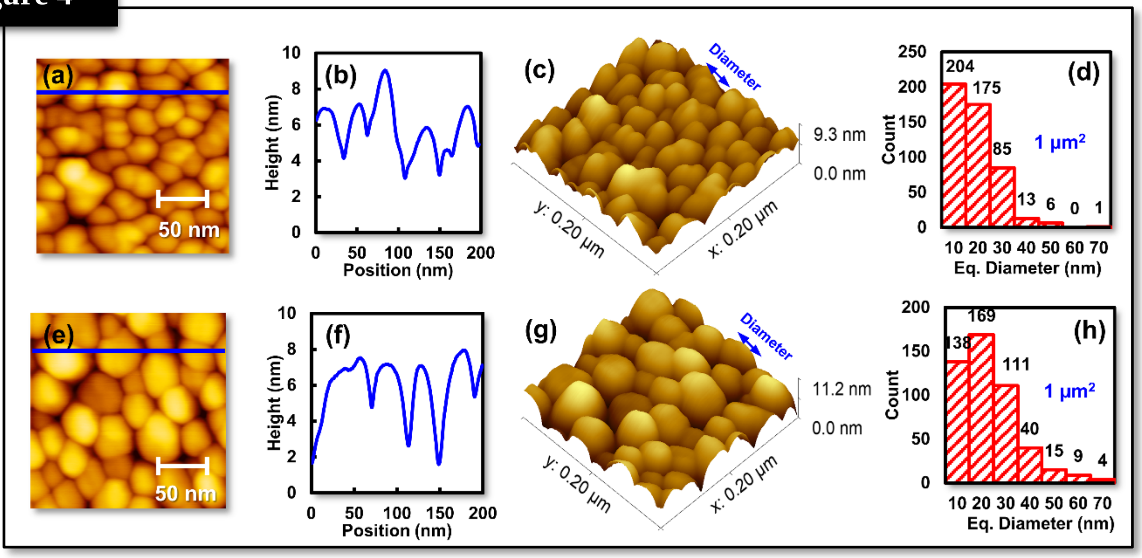


Figure 5

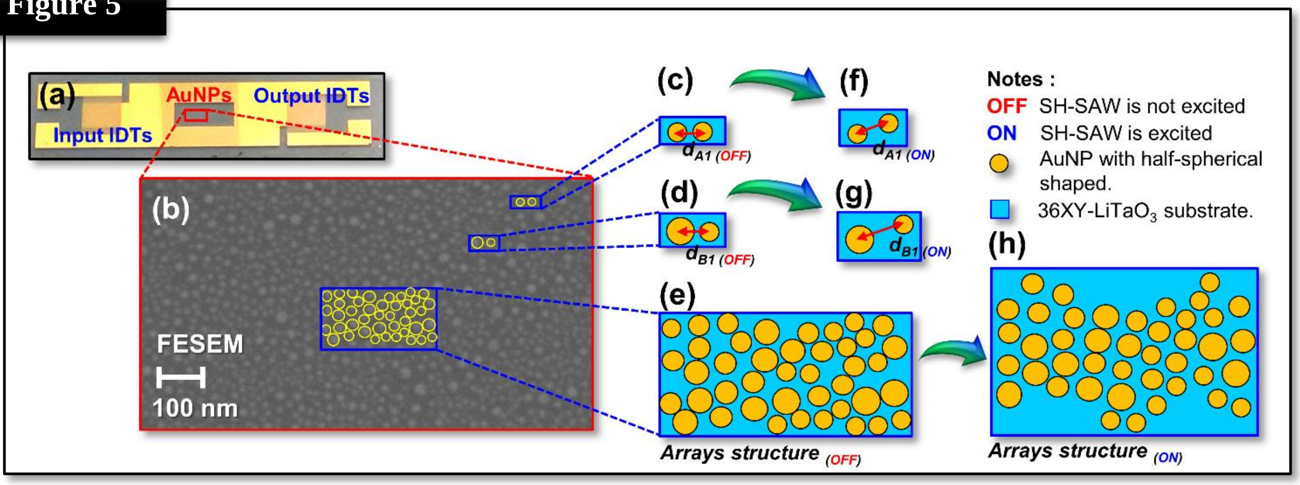


Figure 6

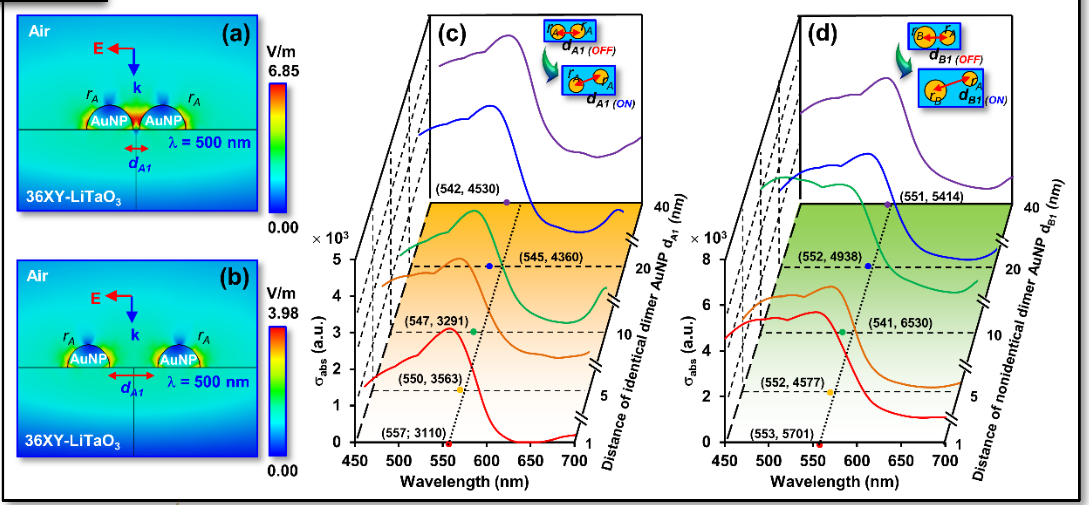


Figure 7

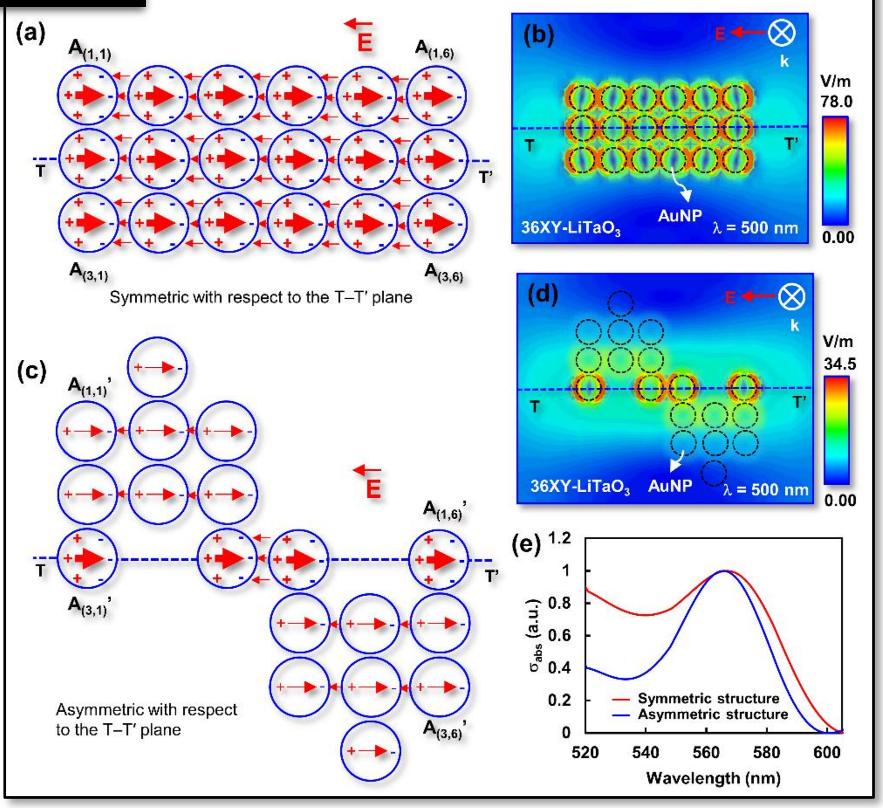
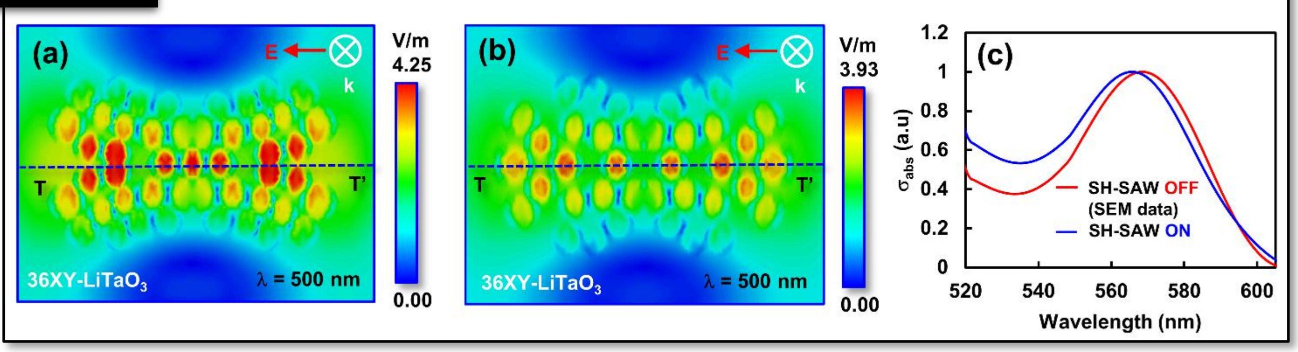


Figure 8



Author action: We updated the manuscript by the yellow highlighted as shown on lines 126, lines 133, lines 238, lines 304, and lines 354

As suggested by the reviewer, we have prioritized the experiment and remodulates the position of the figures. We also provide **new additional data/figures** to enrich the discussion of the paper. The new additional data can be seen in **Figures.** 1(b-c), 2(a-e), 3(d-f), 5(a, c-h), 6(d), 7(e), and 8(a-c) for the main manuscript then **Figures.** S2(a-f) and S4(c) for the supplementary material.

Minor observations

Concern # No. 4:
E-field plasmonic (possible alternative: plasmonic enhanced near field)

Author response: Thank you for your correction. As suggested by the reviewer, we have corrected the term of (E-field plasmonic) to (plasmonic enhanced near field).

Concern # No. 5:
SH-SAWs in key words: I would use the extended version, I don't know how many people know what this acronym means at a first look)

Author response: Many thanks to the reviewer for this feedback. We have revised the keywords in the abstract.

> **Keywords:** Blueshift; interparticle distance of AuNPs; reconfigurable LSPR; shear horizontal surface acoustic waves.

Author action: We updated the manuscript by the yellow highlighted as shown on lines 45.

Concern # No. 6:
Derivative configurations: What is the meaning of "derivative"? Not so clear

Author response: Thank you very much for your review. We have re-focused and re-arranged the paper and figures because it has several confusions. Therefore, we remove the term "derivative".

Concern # No. 7:
Things such as "SEM strong lighting": very vague, what does strong means?

Author response:
Thank you very much for your comment. We agree with reviewers that the description regarding "SEM strong lighting" is not clear. Besides, it has redundancy with another figure. Therefore, we corrected it. Moreover, we have revised the figure, as shown in **Figure 5(b).**

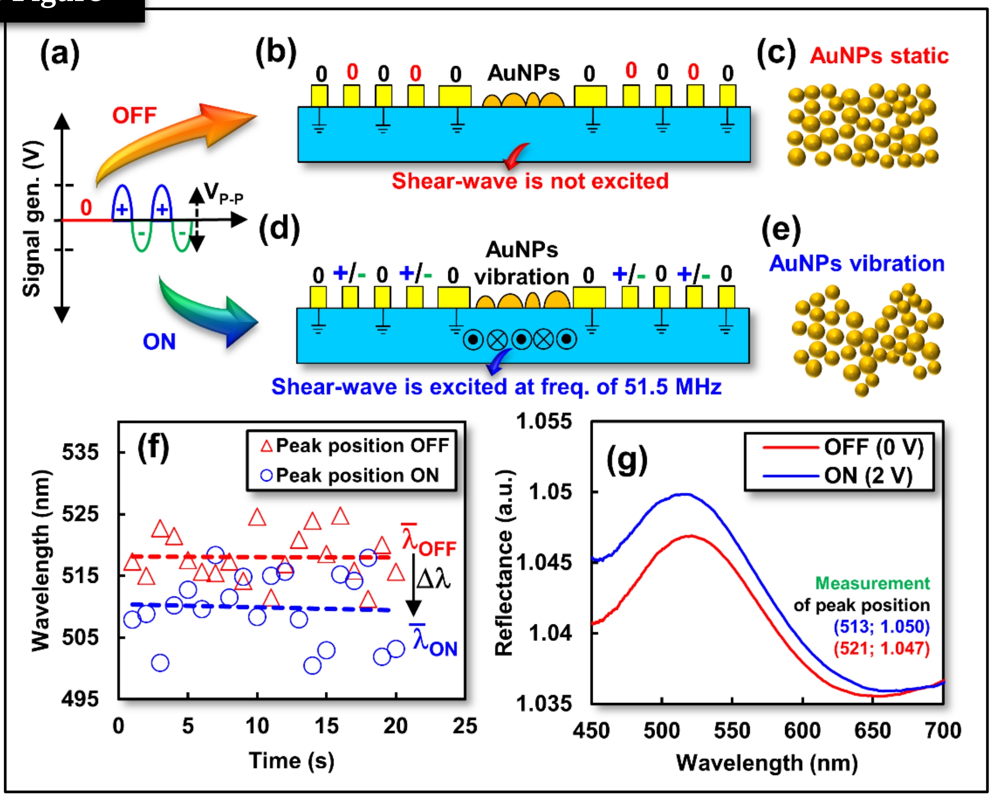
Concern # No. 8:
Fig1 panel B should have wavelength units on the axis

Author response:
Thank you very much for pointing this out. We have re-focused and re-arranged the paper including the figures because it has several confusions. Therefore, we have removed Fig 1 panel B. Moreover, the clearer figure can be seen in **Figure 2(f).**

Concern # No. 9:
TOC figure: different "cases" are not clear what they are, again I would remodulation the figure giving more importance to the experiment.

Author response: We agree with the reviewer. We have prioritized the experiment. Then, we have revised the TOC figure as follows.

TOC Figure



Concern # No. 10:
"A reconfigurable LSPR spectrum": a device which allows the dynamic modulation of the LSPR. In the introduction you mix references which tune the LSPR during the fabrication and thus have static resonances to references which claim to change the LSPR post-fabrication, by for example stretching a PDMS template

Author response:
Thank you very much for your comment. We agree with the reviewer. Therefore, we have revised the introduction part, especially focused on the LSPR post-fabrication as follows.

Various methods can be used to modify LSPR Spectrum [16–18]. In detail, we can separate as two primary classifications strategy: during fabrication and post-fabrication methods, which can generate a static LPSR resonant and a dynamic LPSR resonant, respectively. Moreover, a post-fabrication method gives advantages such as a reconfigurable LPSR capability. A post-fabrication method is commonly developed based on deformable substrates such as polydimethylsiloxane (PDMS) by applying mechanically stretch. Therefore the metal nanoparticle structure or interparticle distances of gold-nanodisks [19] or silver-nanodisks [20] can be modified. Furthermore, the mechanism was successfully expanded by Mizuno *et al* [21] using uniaxial and biaxial strain to obtain high monotonous peak and wavelength shift.

Another interesting post-fabrication reconfigurable LSPR spectrum method is based on hydrogel membrane exchange [22,23]. The main idea of membrane injection is to change the refractive index of the surrounding environment using hydrogel aqueous materials. Therefore, the fully switching OFF-ON of the LSPR resonances is obtained. Moreover, another post-fabrication attractive method is using liquid crystals (LCs) matrix [24,25]. The LCs matrix has an adjustable optical property by changing the molecular orientation using an external trigger such as an electric field. Therefore, the combination between LCs with gold-nanorods [24] or gold-nanodots (AuNDTs) [25] induced by an external electric field can produce a reconfigurable LSPR spectrum.

Author action: We updated the manuscript by the yellow highlighted as shown on lines 63.

Again, we thank you for the valuable time you put into reviewing and evaluating our paper.
Finally, please do not hesitate to contact me if there are any questions.

Yours Sincerely,

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Shizuoka University

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Your Submission

1 pesan

Ernst van Faassen <em@editorialmanager.com> 16 September 2021 pukul 18.07
Balas Ke: Ernst van Faassen <vanfaassen.apsusc@gmail.com>
Kepada: Teguh Firmansyah <teguh.firmansyah81@ui.ac.id>

Ms. Ref. No.: APSUSC-D-21-06298R1
Title: Reconfigurable localized surface plasmon resonance spectrum based on acousto-dynamic coupling in arrays gold nanoparticles induced by shear horizontal vibration
Applied Surface Science

Dear Mr Teguh Firmansyah,

I am pleased to confirm that your paper "Reconfigurable localized surface plasmon resonance spectrum based on acousto-dynamic coupling in arrays gold nanoparticles induced by shear horizontal vibration" has been accepted for publication in Applied Surface Science.

Comments from the Editor and Reviewers can be found below.

Your accepted manuscript will now be transferred to our production department and work will begin on creation of the proof. If we need any additional information to create the proof, we will let you know. If not, you will be contacted again in the next few days with a request to approve the proof and to complete a number of online forms that are required for publication.

I would like to bring an opportunity to your attention, which may be of interest to you. In the course of doing your research you may have collected data, developed your research methods or written software or built hardware. Elsevier offers a suite of open access journals which allow you to publish short articles on these elements of your research, making more aspects of your work sharable, discoverable, citable, comprehensible, and reproducible. Open access fees apply. You can find more information about the Research Elements Journals at: https://www.elsevier.com/authors/tools-and-resources/research-elements-journals

Thank you for submitting your work to this journal.

With kind regards,

Ernst van Faassen
Editor
Applied Surface Science

Comments from the Editors and Reviewers:

Reviewer #3: Dear Authors,

I'm glad my observation helped you improve the paper, which I think now is much more clear and complete. I don't have any other comments to suggest so I'm giving an accept evaluation.

Thank you very much, best regards

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TEGUH FIRMANSYAH <teguh.firmansyah81@ui.ac.id>

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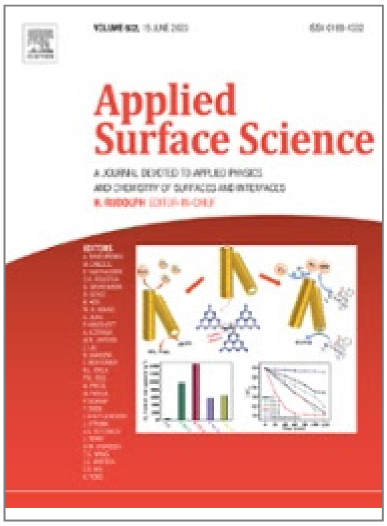

Dear Mr Firmansyah,

Your article *Reconfigurable localized surface plasmon resonance spectrum based on acousto-dynamic coupling in arrays gold nanoparticles induced by shear horizontal vibration* will be published in Applied Surface Science.

To track the status of your article throughout the publication process, please use our article tracking service:

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