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CORRECTION

Correction to: Analyzing the effect of dynamic properties of materials and operating medium on sensor parameters to increase the performance of diaphragm-based static/dynamic pressure sensors

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Correction to:
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The authors of the article would like to thank the reviewer very much for their response to our manuscript. As a result of our evaluations, it was determined that there were typos in some points that reviewer stated. We revised our original manuscript in accordance with the review corrections. In our revision, we addressed all the comments. Here, we provide a list of the amendments below, along with the reviewer's comments given in italic.

Comments

1. *From equation (4) in [1], it is found that the units of* d_c *are* $msec^{-2}$ *, whereas the units of the same parameter in equation (9) in [1] and in nomenclature are m(length).*
   - We thank Reviewer for this comment and warning us about the mistake that we missed. It has been added to the article as indicated below.

Correction in the article

$$\ddot{d} + 2\gamma\dot{d} + \delta^2 d = \frac{kd_c}{m}\cos\omega t \tag{4}$$

Here $\gamma = c/2m$, $\delta = \sqrt{(k/m)}$, and $d_c = F_0/k$ are given. The solution of Eq. (3), which expresses the steady-state response of its system, is given in Eq. (5) [34].

2. *Equation (13) in [1] is as follows.*

   $$T_f = 0.0102\rho' r d_c \tag{1}$$

   where T_f *is the kinetic energy of the fluid (nomenclature). From equation (1), it is found that the units of* T_f *are* Kgm^{-1}*. However, kinetic energy with these units does not exist in Physics.*
   - We thank Reviewer for warning us about the mistake that we missed. In the article, Eq. (13) is corrected as indicated below. In addition, the value u_0 is added to Table 1.

Correction in the article

$$T_f = 0.2102\rho' r^3 u_0^2 \tag{13}$$

3. *In equations (1) and (4) in [1] the parameter t represents time and in equation (12) in [1] and in nomenclature t is thickness (length).*
   - Thanks to the reviewer for his warning. To avoid confusion, Eq. (12) is arranged as follows. In addition, the abbreviation is arranged in Table 1.

The original article can be found online at https://doi.org/10.1007/s10825-020-01633-z.

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Table 1 Definition of variables.

Variables	Definition
r	Radius of the diaphragm
t_d	Thickness of the diaphragm
d	Dynamic deflection
d_c	Static deflection at the center
P	Pressure
E	Young's Modulus of the diaphragm material
v	Poisson's ratio of the diaphragm material
f_{mn}	The natural frequency of the diaphragm
f	Excitation frequency
f_f	The frequency of the diaphragm in the fluid
ξ	The damping ratio of the medium
φ_{mn}	*mn* order vibration mode
T_f	The kinetic energy of the fluid
T_d	The maximal kinetic of the diaphragm in the vacuum
β	Added virtual mass incremental (AVMI) factor
ρ	The mass density of the diaphragm
ρ'	The mass density of the liquid
S	Dynamic sensitivity
u_0	Initial velocity of the diaphragm

Correction in the article

$$d_c = \frac{3\left(1 - v^2\right)Pr^4}{16Et_d^3} \tag{9}$$

$$\beta = 0.6689\frac{\rho' r}{\rho t_d} \tag{15}$$

$$f_{mn} = \frac{\varphi_{mn}^2}{2\pi r^2}\sqrt{\frac{Et_d^2}{12\rho\left(1 - v^2\right)}} \tag{12}$$

4. *In equation (1) in [1], the units of the term* $2\xi\frac{\partial w}{\partial t}$ *are* $m\,\mathrm{sec}^{-1}$ *instead of* kgm^{-1} *sec*$^{-2}$.
   - The transverse deflection of the circular diaphragm vibration equation for forced oscillations is consistent with the following literature. The literature information on the relevant formula can be seen in equation 3 of ref [27] in our reference list. Ref [27] is given as a reference for equation 1 of our article. Since we did not see any inconvenience, the relevant formula was used without making any changes in the article.

Correction in the article

The dynamic response of the diaphragm for forced oscillations is governed by Eq. (1). For vibration analysis of the circular diaphragm in a vacuum, transverse deflection is admitted being w [27].

$$D\nabla^4 w + \rho h\frac{\partial^2 w}{\partial t^2} + 2\xi\frac{\partial w}{\partial t} = P(r, \theta, t) \tag{1}$$

Supporting literature

- Yu, M., & Balachandran, B. (2003). Acoustic measurements using a fiber optic sensor system. Journal of Intelligent Material Systems and Structures, 14(7), 409–414.

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interferometer is a Mach-Zehnder interferometer as shown in Figure 1(b), then the associated transfer function is

$$H_t^r = \frac{E_t \cdot E_t^*}{E_i \cdot E_i^*} = \frac{1}{2}[1 + \cos k(L_2 - L_1)] = \frac{1}{2}[1 + \cos kL_r], \tag{6}$$

where L_r is the cavity length of the reference interferometer. When the light passes though the PMDI

For forced oscillations, the governing equation is of the form

$$D\nabla^4 w + \rho h\frac{\partial^2 w}{\partial t^2} + 2\mu\frac{\partial w}{\partial t} = p(t), \tag{11}$$

where $p(t)$ is the dynamic sound pressure to be sensed with amplitude of p, ρ is density of the diaphragm material, υ is Poisson ratio, and $D = Eh^3/12(1 - \upsilon^2)$. The solution of Equation (11) can be written as

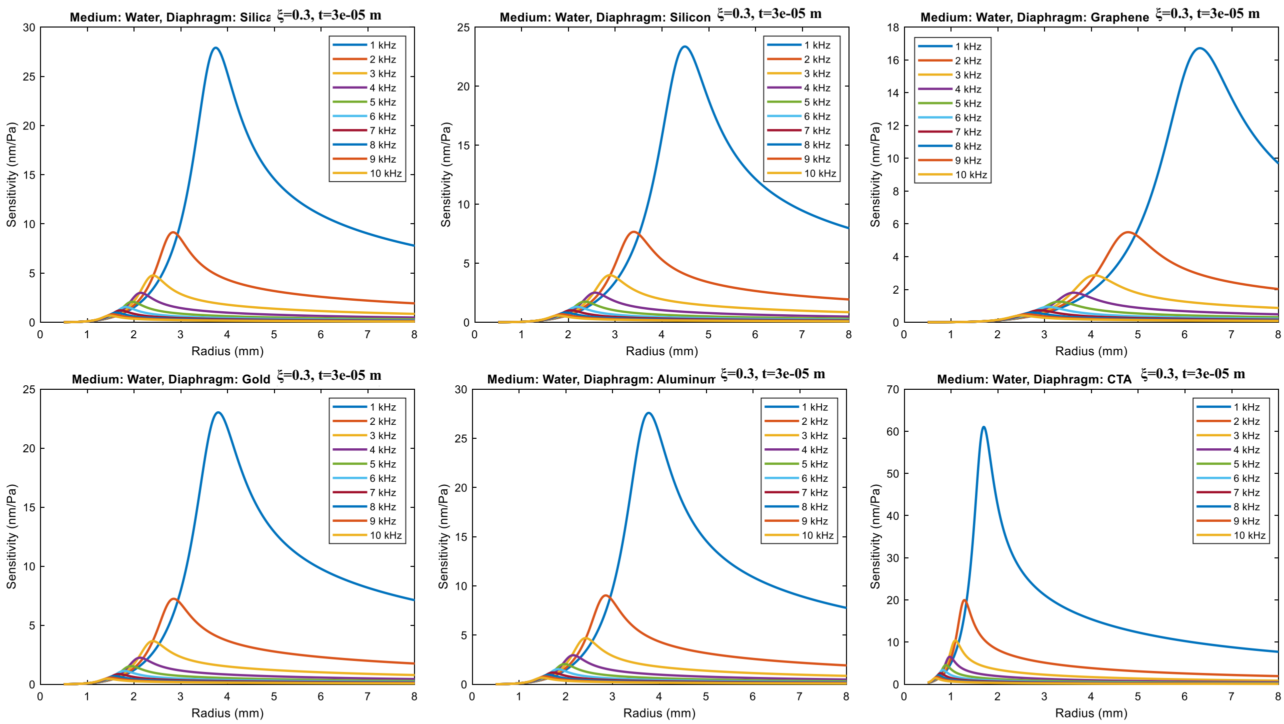

Fig. 7 Dynamic sensitivity versus radius at different frequencies with various diaphragm materials in the water ($\xi = 0.3$).

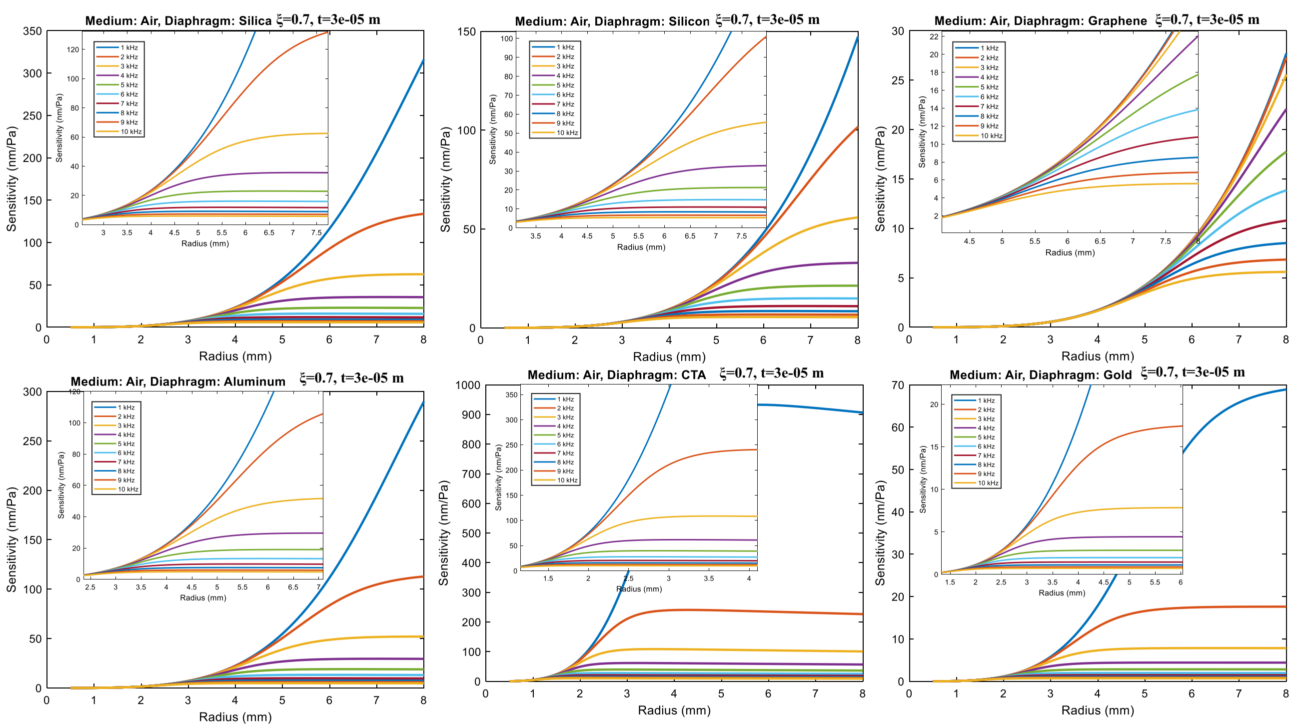

Fig. 8 Dynamic sensitivity versus radius at different frequencies with various diaphragm materials in the air ($\xi = 0.7$).

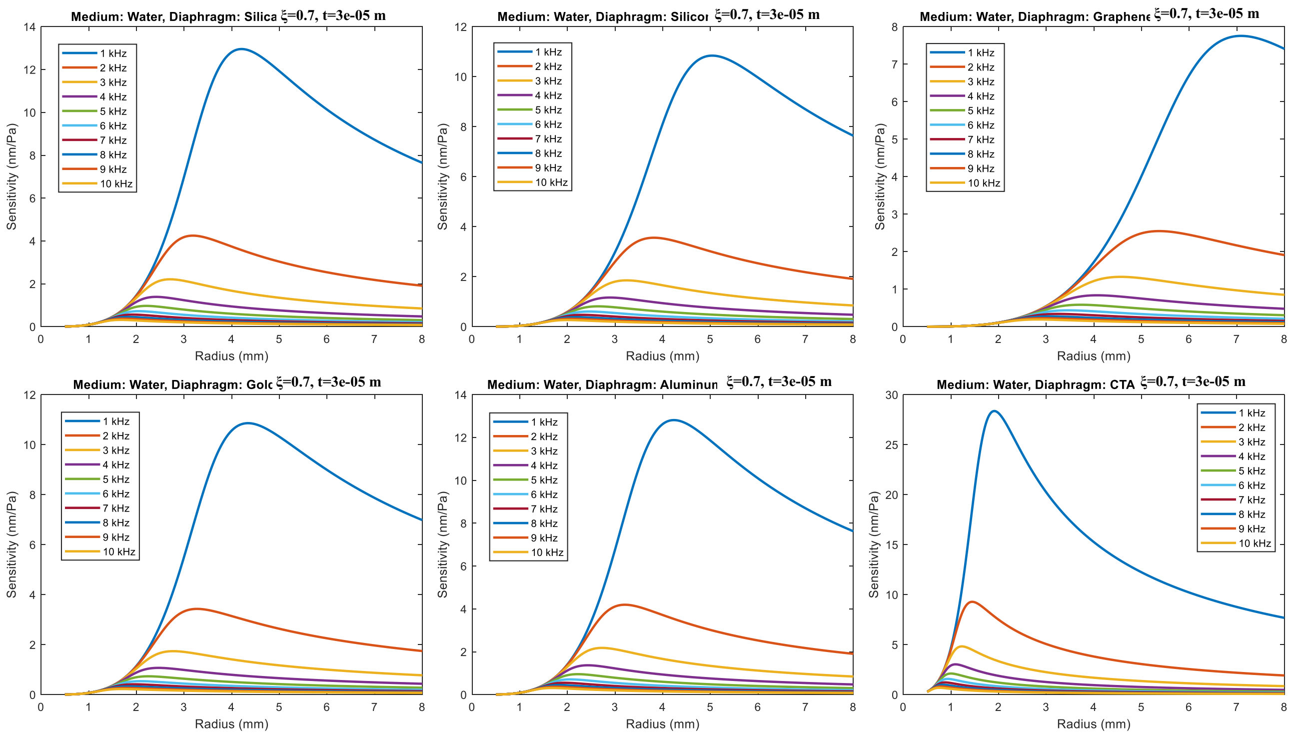

Fig. 9 Dynamic sensitivity versus radius at different frequencies with various diaphragm materials in the water ($\xi = 0.7$).

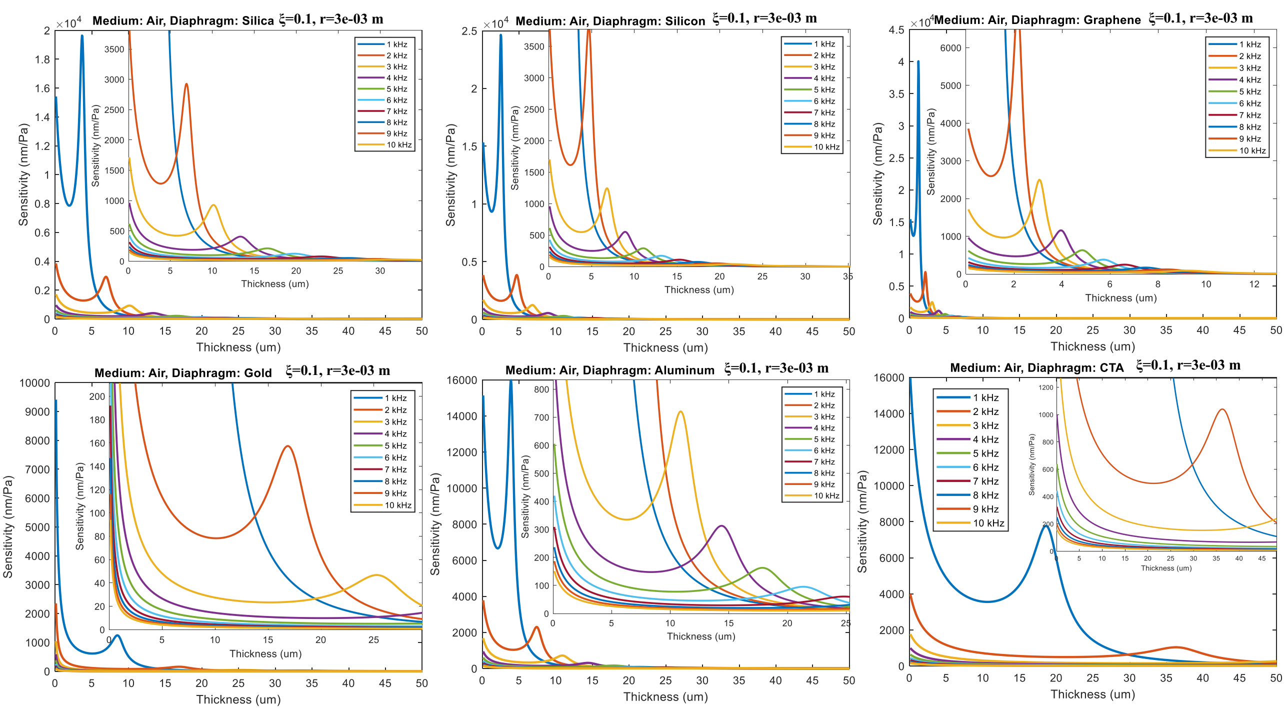

Fig. 10 Dynamic sensitivity versus thickness at different frequencies with various diaphragm materials in the air ($\xi = 0.1$).

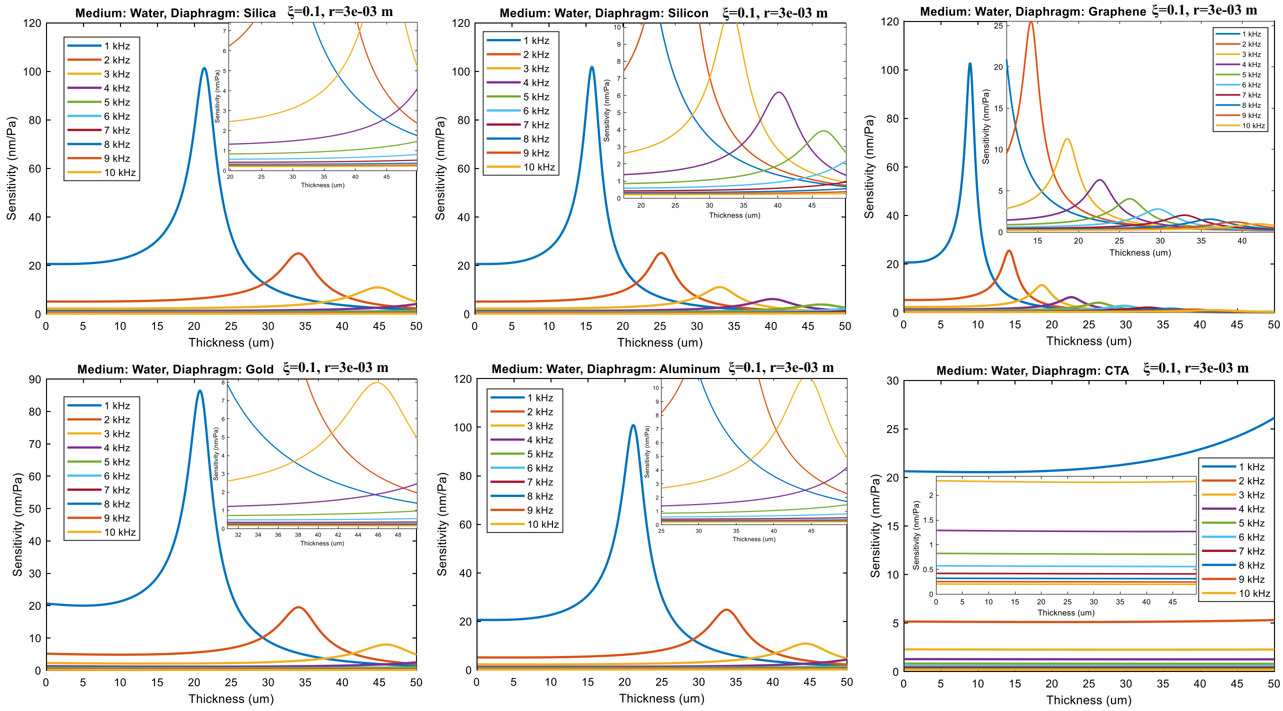

Fig. 11 Dynamic sensitivity versus thickness at different frequencies with various diaphragm materials in the water ($\xi = 0.1$).

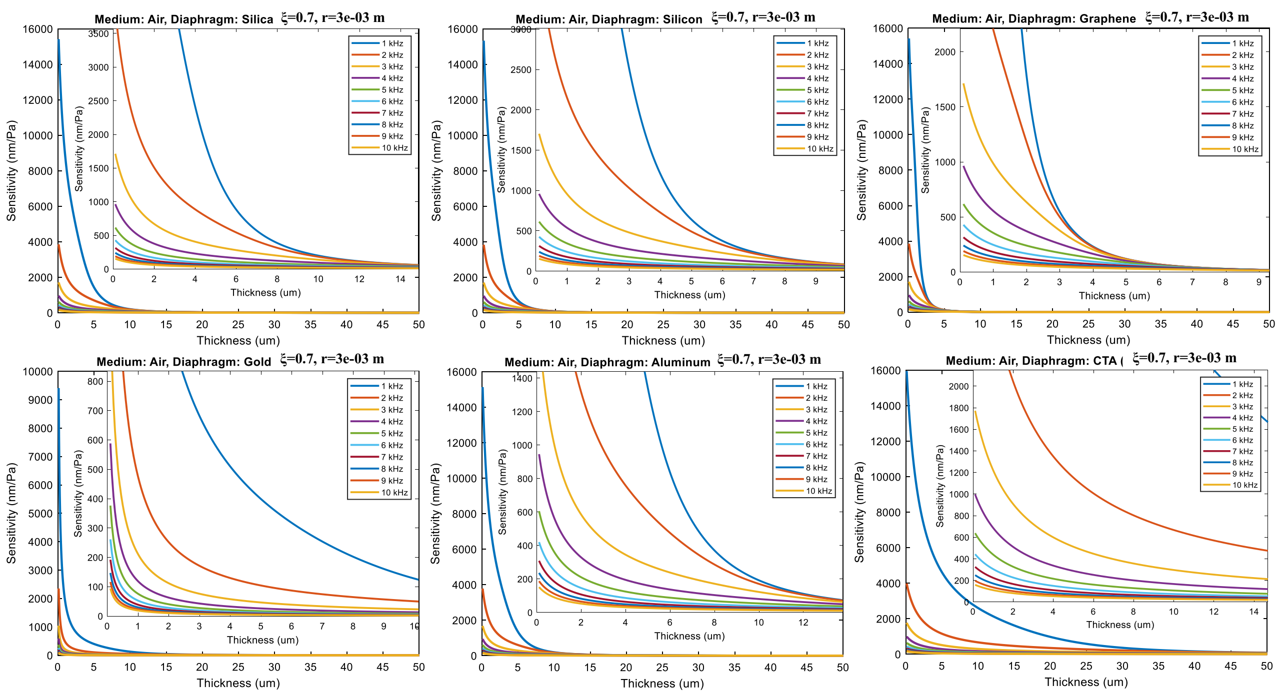

Fig. 12 Dynamic sensitivity versus thickness at different frequencies with various diaphragm materials in the air ($\xi = 0.7$).

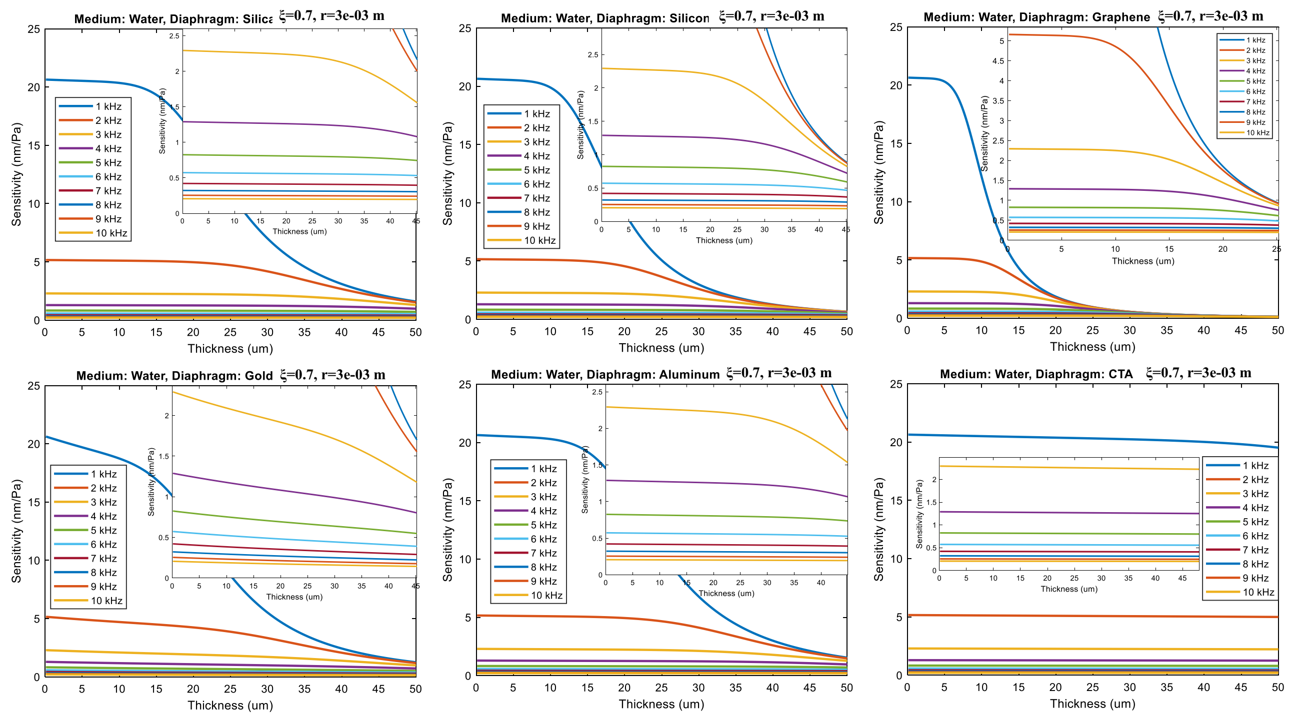

Fig. 13 Dynamic sensitivity versus thickness at different frequencies with various diaphragm materials in the water ($\xi = 0.7$).

- Ni, W., Lu, P., Fu, X., Zhang, W., Shum, P. P., Sun, H., ... & Zhang, J. (2018). Ultrathin graphene diaphragm-based extrinsic Fabry-Perot interferometer for ultra-wideband fiber optic acoustic sensing. Optics express, 26(16), 20758–20767.
- Yu, M. (2002). Fiber-optic sensor systems for acoustic measurements. University of Maryland, College Park (pp. 49).
- Yu, M., & Balachandran, B. (2005). Sensor diaphragm under initial tension: linear analysis. Experimental mechanics, 45, 123–129.

1. *In figures appears an unknown dimensionless parameter dr.*

   Thanks to the reviewer for his warning. The ξ value is mistakenly written as dr in the graphs. The graphics have been corrected and added to the article.

Correction in the article

See Figs. 7, 8, 9, 10, 11, 12, and 13.

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