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Response to “Comment on the paper ‘Electromagnetic modeling of ellipsoidal nanoparticles for sensing applications’”

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Abstract. The authors respond to the comments by Mackay and Lakhtakia. © The Authors. Published by SPIE under a Creative Commons Attribution 3.0 Unported License. Distribution or reproduction of this work in whole or in part requires full attribution of the original publication, including its DOI. [DOI: [10.1117/1.OE.52.7.079702](https://doi.org/10.1117/1.OE.52.7.079702)]

First of all, we would like to thank Mackay and Lakhtakia¹ who have carefully read our paper and for their valuable comments on our manuscript. We agree that the polarizability is a dyadic.

For our aims (analytical models, full-wave simulations, and sensitivity analysis), we have assumed the impinging electromagnetic field as a plane wave having the electric field \mathbf{E} parallel to the nanoparticle principal axis (x -axis as depicted in the Fig. 1 of the paper). In this case, Eq. (1) and the following equations refer only to scalar component $\hat{x}\hat{x}$ of the dyadic polarizability $\underline{\alpha}$ (sufficient to evaluate the

nanoparticle response under the aforementioned excitation condition).

We have to point out that for sensing applications the analyzed polarization is crucial in order to obtain the best sensitivity performances.

References

1. T. G. Mackay and A. Lakhtakia, “Comment on the paper ‘Electromagnetic modeling of ellipsoidal nanoparticles for sensing applications’,” *Opt. Eng.* **52**(7), 079701 (2013).