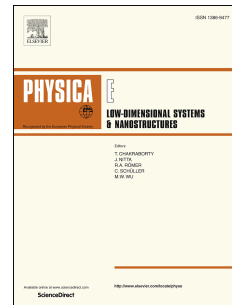


Accepted Manuscript

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PII: S1386-9477(18)30746-X

DOI: [10.1016/j.physe.2018.07.039](https://doi.org/10.1016/j.physe.2018.07.039)

Reference: PHYSE 13242

To appear in: *Physica E: Low-dimensional Systems and Nanostructures*

Received Date: 19 May 2018

Accepted Date: 31 July 2018

Please cite this article as: A. Farmani, A. Mir, M. Bazgir, F.B. Zarrabi, Highly sensitive nano-scale plasmonic biosensor utilizing Fano resonance metasurface in THz range: Numerical study, *Physica E: Low-dimensional Systems and Nanostructures* (2018), doi: 10.1016/j.physe.2018.07.039.

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Highly Sensitive Nano-scale Plasmonic Biosensor Utilizing Fano Resonance Metasurface in THz Range: Numerical Study

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Abstract

We report a numerical study of the tunable-enhanced sensitivity of a nano-scale plasmonic biosensor in THz range. In the structure, gold Metasurface is utilized to excite of Fano resonance modes that their dispersion properties can be harnessed with different geometrical parameters. Here, the coupling of the incident beam to the surface modes of the structure is used to improve the performance parameters including figure of merit, sensitivity, and footprint. The Fano resonance, which is strongly rely on any change in refractive index of the material, is excited in the structure by changing geometrical parameters. The structure is numerically simulated by the finite difference time domain method. In the optimum design of the proposed sensor, the maximum value of sensitivity is achieved as high as $S = 1700$ nm/refractive

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