Detail of Patents

Indian Patent (Granted)

I. Jitendra Bahadur Maurya, **Y. K. Prajapati***, "Method to determine beam width of a dip in surface plasmon resonance sensor and its application," (Patent No.: 407708, Application No.: 201611005417, Date of Grant: 29.09.2022)

II. Subha Sarkar, **Yogendra Kumar Prajapati*** and Rajeev Tripathi, "Low Power, Uniform Frequency Resolution and High Sampling Speed Arbitrary Waveform Generator," (Patent No.: 461154, Application No.: 201811032831, Date of Grant: 20.10.2023)

III. **Yogendra Kumar Prajapati**; Piyus Sil; Piyus, "Integrated health-monitoring device and a method of real time transfer of health condition data collected," (Patent No.: 469442, Application No: 201611025089, Date of Grant: 16.11.2023)

International Patent (Published)

i. Sarika Pal, **Yogendra Kumar Prajapati**, Maneesh Kumar Singh, Vipin Kumar Verma, "A system for an improved long-range surface plasmon resonance (LR-SPR) sensor with extremely high imaging sensitivity," (App. No.: DE 202022100430U12022.03.17) Published on March, 2022.

Details of Consultancy Work

i. A third-party audit of Electrical work related to electrification at Balrampur, Uttar Pradesh under Uttar Pradesh Rajkiya Nirman Nigam, Rs. 1.35 Lakh, December 2022-January 2023 **(As a PI)**

ii. Third party audit of Electrical work related to the quality at Siddharthnagar, Uttar Pradesh under Uttar Pradesh Rajkiya Nirman Nigam, Rs. 2.89 Lakh, December 2022-January 2023 **(As a PI)**

iii. Third party evaluation of CCTV, Wi-Fi, and Solar Light work in District- Kushinagar, Uttar Pradesh, under Uttar Pradesh Rajkiya Nirman Nigam, Rs. 1.50 Lakh, Octiber 2021-November 2021 **(As a PI)**

iv. Veekay Connectors(P) Ltd., Naini, Allahabad for Confirmatory tests of fiber optical splitter with microlens chip, Rs. 50,000/- (As a member)

Book as an Editor

R.K. Nagaria, V.S.Tripathi, C.R. Zamarreno, and Y.K. Prajapati, eds., "*VLSI, Communication and Signal Processing: Select Proceedings of the 5th International Conference," VCAS 2022* (Vol. 1024), 2023. Springer Nature.

Detail of Funded Research Projects

1. "A Simulation and Experimental Study on Screening the Best Materials Combination for Specific Target Detection in Plasmonic Sensors Using Machine Learning Techniques," Funding Agency: Council of Science & Technology U.P., Rs. 15 Lakhs, Duration: 3 Years (2024-27) (Status: Ongoing) (PI),
2. "Prototype development of a photovoltaic solar cell with a high conversion efficiency: An application of two-dimensional materials," Funding Agency: Council of Scientific & Industrial Research (CSIR), India, Rs. 25 Lakhs, Duration: 2 Years (2023-26) (Status: Ongoing) (PI),
3. "Design and development of a non-invasive, smart, and portable device for real-time assessment of bone fracture healing progression," Funding Agency: Core Research Grant, SERB, Rs. 49 Lakhs, Duration: 3 Years (2023-26) (Status: Ongoing) (Co-PI),
4. "Investigations on surface plasmon resonance (SPR) based optical sensing with an emphasis on the role of spin waves and magnonics in related materials," Funding Agency: Core Research Grant, SERB, Rs. 20.44 Lakhs, Duration: 3 Years (2019-22) (Status: Completed) (Co-PI), .
5. "Role of graphene and MoS2 on performance of surface plasmon resonance-based sensors: An application to biosensing," Funding Agency: Research Grant, DAE-BRNS, Rs. 24.00 Lakhs,

Duration: 3 Years (2017-21) (Status: Completed) (PI)

6. "Phosphorene based fiber optic plasmonic sensor for biomedical application," Funding Agency: Collaborative Research Scheme Under NPIU Rs. 15.00 Lakhs, Duration: 3 Years (2019-22) (Status: Completed) (Co-PI)
7. "Design and Analysis of Optical Waveguide for Biosensing Application," Funding Agency: Collaborative Research Scheme Under NPIU, Rs. 13.00 Lakhs, Duration: 3 Years (2019-22) (Status: Completed) (Co-PI)
8. "To strengthen the post-graduate Teaching and Research in the Department," Funding Agency: DST-FIST, Rs. 1.06 Crores, (Status: **Completed**), (**Convener & PI**)
9. "Design and Study of Sensitivity of optical biosensors having Metamaterials", Funding Agency: ECR, SERB, Rs. 23.39 Lakhs, Duration: 3 Year (2014-17), (Status: Completed) (PI)
10. "Design of biosensors using metal clad for sensing application," Ref.No.146/R&C/13-14 dated on 02/09/2013, Funding Agency: Motilal Nehru National Institute of Technology (MNNIT), Allahabad, India under TEQIP-II, Duration (2013-14) (Status: Completed) (PI)
11. "Simulation and numerical analysis of optical microstructure fibers: Dispersion characteristic," Ref.No.134/R&C/13-14 dated on 23/08/2013&Ref. No. 360/R & C/13-14, dated 07/03/2014, Funding Agency: Motilal Nehru National Institute of Technology (MNNIT), Allahabad, India under seed grant, Duration (2013- 14) (Status: Completed) (PI)

Publications *(List of papers published in IEEE Journals, in year wise descending order)*

1. Kumar, Rajeev, Sarika Pal, Narendra Pal, Alka Verma, J. P. Saini, and Yogendra Kumar Prajapati. "MXene-Enhanced Plasmonic Sensor Utilizing Planar Waveguide Modes and Long-Range Surface Plasmon Polaritons for Ultra-Sensitive Detection." IEEE Sensors Journal , 3 January 2025, DOI: 10.1109/JSEN.2024.3523178 (Impact factor:4.3 ,Quartile Score:Q1)
2. Kumar, Virendra, Sarika Pal, Vivek Singh, Bela Goyal, Lalit Kumar Awasthi, and Yogendra Kumar Prajapati. "On the Feasibility of Thallium Bromide in Long-Range Plasmonic Sensing for Enhancement of Performance." IEEE Transactions on Plasma Science, 8 October 2024, DOI: 10.1109/TPS.2024.3468954, (Impact Factor : 1.3 ,Quartile Score:Q2)
3. Rana, Jatin, Anuj K. Sharma, and Yogendra Kumar Prajapati*. "Intervention of machine learning and explainable artificial intelligence in fiber optic sensor device data for systematic and comprehensive performance-optimization." IEEE Sensors Letters, vol. 8, no. 10, 21 August 2024, DOI: 10.1109/LSENS.2024.3445324, (Impact factor 2.2 ,Quartile Score:Q2)
4. Yesudasu, Vasimalla, Rupam Srivastava, Sarika Pal, MS Mani Rajan, and Yogendra Kumar Prajapati*. "Surface-Plasmon and Titanate Material-Assisted Sensor Structure for Pseudomonas Bacteria Detection With Increased Sensitivity." IEEE Transactions on AgriFood Electronics, 8 April 2024, DOI: 10.1109/TAFE.2024.3379378.
5. S. Agarwal, R. Srivastava, S. Kumar and Yogendra Kumar Prajapati*, "COVID-19 Detection Using Contemporary Biosensors and Machine Learning Approach: A Review," IEEE Transactions on NanoBioscience, vol. 23, no. 2, pp. 291-299, April 2024, doi: 10.1109/TNB.2023.3342126 (Impact factor: 3.9, Quartile Score: Q1)
6. Srivastava, Rupam, Vinit Kumar, Shrayansh Tyagi, Sarika Pal, Anuj K. Sharma, and Yogendra Kumar Prajapati*. "On the Feasibility of Particle Swarm Optimization Method for Inverse Design of High-Performance SPR Biosensor." IEEE Sensors Journal, 2 April 2024, DOI:10.1109/JSEN.2024.3381250, (Impact factor:4.3 ,Quartile Score:Q1)
7. Harshit Tiwari; Yogendra S. Dwivedi; Rishav Singh; Yogendra Kumar Prajapati; Richa Krishna; Nitin Singh Singha, Anuj K Sharma, "Exploring deep learning models aimed at favorable optimization and enhancement of fiber optic sensor's performance," IEEE Sensors Journal, August 2023, DOI 10.1109/JSEN.2023.3296199, (Impact factor: 4.3, Quartile Score: Q1)
8. Vinit Kumar, Rupam Srivastava, Yogendra Kumar Prajapati*, "Improved photonic spin Hall effect by an induced polarization gradient in anisotropy- black phosphorous and its application to NO2 gas detection," IEEE Sensors Journal, August 2023, DOI :10.1109/JSEN.2023.3301965 (Impact factor: 4.3, Quartile Score: Q1)
9. Rajeev Kumar, Alka Verma, Sarika Pal, Yogendra Kumar Prajapati*, "Enhancing the Gas detection sensitivity of Surface Plasmon Resonance Sensor based on MXene and Black phosphorus," IEEE Transction on Plasma Science, Vol. 51 (6), pp. 1427-1433, June 2023,10.1109/TPS.2023.3276371.

(Impact factor: 1.368, Quartile Score: Q3)

10. Shivam Singh, Yogendra Kumar Prajapati*, "Novel Bottom-Side Polished PCF-Based Plasmonic Biosensor for Early Detection of Hazardous Cancerous Cells," IEEE Transactions on Nanoscience, vol. 22 (1), pp. 647- 654, July 2023, https://doi:10.1109/TNB.2023.3233990 (Impact factor: 2.967, Quartile Score: Q1)
11. Maneesh Kumar Singh, Sarika Pal, and Yogendra Kumar Prajapati*, "Design and Analysis of an SPR Sensor based on Antimonene and Platinum for the Detection of Formalin," IEEE Transactions on NanoBioscience, vol. 22, no. 1, pp. 106-112, Jan. 2023, https://doi:10.1109/TNB.2022.3159532 (Impact factor: 3.9, Quartile Score: Q1)
12. Rupam Srivastava, Yogendra Kumar Prajapati*, Sarika Pal, Santosh Kumar, "Micro-channel Plasmon Sensor Based on a D-Shaped Photonic Crystal Fiber for Malaria Diagnosis with Improved Performance," IEEE Sensors Journal, https://DOI:10.1109/JSEN.2022.3181198 June 2022, (Impact factor: 4.3, Quartile Score: Q1)
13. Rajeev Kumar, Sarika Pal, Yogendra Kumar Prajapati*, Santosh Kumar, "Sensitivity Improvement of a MXene-immobilized SPR Sensor with Ga-doped-ZnO for Biomolecules Detection," IEEE Sensors Journal, vol. 22, no. 7, pp. 6536-6543, April 2022. (Impact factor: 4.3, Quartile Score: Q1)
14. V.A. Popescu, Y.K. Prajapati, Anuj K. Sharma, "Highly Sensitive Magnetic Field Detection in Infrared Region with Photonic Spin Hall Effect in Silicon Waveguide Plasmonic Sensor," IEEE Transactions on Magnetics, Vol. 57, no. 10, pp. 4002210, August 2021. https://doi:10.1109/TMAG.2021.3103651 (Impact factor: 2.1, Quartile Score: Q2)
15. [14].Maneesh Kumar Singh, Sarika Pal, Y.K. Prajapati*, J.P. Saini, "Sensitivity Improvement of Surface Plasmon Resonance Sensor on using BlueP/MoS2 Heterostructure and Antimonene," IEEE Sensors Letters, vol.4, no. 7, pp. 1-4, July 2020, https://DOI:10.1109/LSENS.2020.3005942 (Impact factor: 2.8, Quartile Score: Q2)
16. J. B. Maurya, Y.K. Prajapati*, "Experimental Demonstration of DNA Hybridization Using Graphene-Based Plasmonic Sensor Chip," IEEE Journal of Lightwave Technology, Vol. 38, issue 18, pp. 5191-5198, DOI: 10.1109/JLT.2020.2998138, September 15, 2020. (Impact factor: 4.439, Quartile Score: Q1)
17. J.B.Maurya, Y.K.Prajapati*, "A Novel Method to Calculate Beam Width of SPR Reflectance Curve: A Comparative Analysis," IEEE Sensor Letters, Vol. 1, issue 4, pp. 1-4, https://doi.org/10.1109/LSENS.2017.2709549 , August 2017. (Impact factor: 2.8, Quartile Score: Q1)
18. Sajal Agarwal, Pushpa Giri, Y. K. Prajapati*, P. Chakrabarti, "Effect of Surface Roughness on the Performance of Optical SPR Sensor for Sucrose detection: Fabrication, Characterization and Simulation Study," IEEE Sensors Journals, Vol. 16, No. 24, pp. 8865 – 8873, December 2016, (Impact factor: 4.3, Quartile Score:Q1).
19. Sajal Agarwal, Y. K. Prajapati*, J.B.Maurya, "Effect of Metallic Adhesion Layer Thickness on the Sensor Performance," IEEE Photonics Technology Letters, 28(21), pp. 2415-2418, Nov. 2016. https://doi.org/10.1109/LPT.2016.2597856 (Impact factor: 2.414, Quartile Score: Q2)

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20. Alhawari, Adam RH, Abdulkarem HM Almawgani, Malek G. Daher, Sofyan A. Taya, and Yogendra Kumar Prajapati. "A Novel Surface Plasmon Resonance (SPR) Sensor Based on Beryllium Oxide and Graphene Layers for Fuel Adulteration Discovery." *Plasmonics,* pp. 1-10, 6 January 2025, DOI: https://doi.org/10.1007/s11468-024-02657-y (Impact Factor 3.3 ,Quartile Score:Q3)
21. Alhawari, Adam RH, Abdulkarem HM Almawgani, Sofyan A. Taya, Malek G. Daher, Yogenra Kumar Prajapati, and Hussein S. Gumaih. "Highly sensitive protein sensor based on surface plasmon resonance nanostructure employing titanium dioxide and graphene layers." *Diamond and Related Materials* Vol 151, pp. 111867, 1 January 2025, DOI: https://doi.org/10.1016/j.diamond.2024.111867 (Impact Factor 4.3 ,Quartile Score:Q2)
22. Kumar, Rajeev, Sajal Agarwal, Narendra Pal, Sarika Pal, and **Yogendra Kumar Prajapati.** "Platinum diselenide (PtSe2) mediated heterostructure based SPR sensor for the detection of formalin: a theoretical analysis." *Physica Scripta,* Vol 100, no. 1, pp. 015546, 30 December 2024, DOI: 10.1088/1402-4896/ad9e46(Impact Factor 2.6, Quartile Score: Q2)
23. Daher, Malek G., Sofyan A. Taya, Osama S. Faragallah, Mohammed A. AlZain, Abdulkarem HM

Almawgani, Ahmad Alzahrani, **Yogenra Kumar Prajapati**, Ammar Armghan, and Samer H. Zyoud. "Supersensitive Novel Detector using Surface Plasmon Resonance Nanostructure Based on Black Phosphorus/Graphene for the Discovery of Various Pathogens in Drinking Water." *Plasmonics* , pp:1-9, 27 December 2024, DOI: https://doi.org/10.1007/s11468-024-02678-7 (Impact Factor 3.3 ,Quartile Score:Q3)

24. Gumaih, Hussein S., Abdulkarem HM Almawgani, Malek G. Daher, Yousif S. Adam, Sofyan A. Taya, and Yogenra Kumar Prajapati. "Novel detection of progesterone and estradiol levels in blood using sensitive SPR biosensor employing cerium oxide and MXene nanomaterial." *Journal of Optics* pp: 1-11, 14 December 2024, DOI: https://doi.org/10.1007/s12596-024-02352-5 (Impact Factor 1.6 ,Quartile Score:Q3)
25. Tiwari, Harshit, Yogendra S. Dwivedi, Rishav Singh, Anuj K. Sharma, Ajay Kumar Sharma, Richa Krishna, Nitin Singh Singha, Yogendra Kumar Prajapati, and Carlos Marques. "Deep Learning-Enabled De-Noising of Fiber Bragg Grating-Based Glucose Sensor: Improving Sensing Accuracy of Experimental Data." Photonics, vol. 11, no. 11, pp. 1058. MDPI, November 2024, DOI: https://doi.org/10.3390/photonics11111058 (Impact Factor: 2.1, Quartile Score:Q2)
26. Srivastava, Saarthak, Rupam Srivastava, Deepak Punetha, Anuj K. Sharma, and Yogendra Kumar Prajapati*. "Enhancing the efficiency of lead-free Cs2AgBiBr6 based double perovskite solar cells with optimizing ETLs and HTLs using SCAPS-1D." Chemical Physics Letters, vol. 854, pp. 141557, November 2024. DOI: https://doi.org/10.1016/j.cplett.2024.141557, (Impact Factor: 2.8, Quartile Score: Q2)
27. Yesudasu, Vasimalla, Rupam Srivastava, Sarika Pal, Alka Verma, and Yogendra Kumar Prajapati* "Performance Enhancement of SPR Sensor for Dengue Virus Detection: Influence of Aluminum Nitride and 2D Materials." Plasmonics, pp. 1-14, 23 October 2024, DOI: https://doi.org/10.1007/s11468-024-02574- 0, (Impact Factor 3.3 ,Quartile Score:Q3)
28. Daher, Malek G., Sofyan A. Taya, Osama S. Faragallah, Shobhit K. Patel, Yogendra Kumar Prajapati, and Ammar Armghan. "Optical Detection of Urea Level in Blood Using Novel SPR Sensor Employing Silicon and Tungsten Diselenide Nanomaterial for the Early Diagnosis of Heart and Kidney Diseases." Plasmonics, pp. 1-10, 21 October 2024, DOI: https://doi.org/10.1007/s11468-024-02588-8, (Impact Factor 3.3 ,Quartile Score:Q3)
29. Agarwal, Sajal, Rahul Raparia, Vinit Kumar, Rupam Srivastava, and Yogendra Kumar Prajapati. "Analytical Study of SPR Sensor with Black Phosphorus and Tungsten Diselenide Heterostructure for Milk Adulteration Detection." Plasmonics, pp. 1-10, 02 October 2024, DOI: https://doi.org/10.1007/s11468-024-02496-x (Impact factor 3.3 ,Quartile Score:Q3)
30. Srivastava, Rupam, Vinit Kumar, and Yogendra Kumar Prajapati*. "Highly sensitive SPR based PCF sensor for broader analyte detection range including blood compositions detection." Optik, vol 314, pp. 172010, 1 October 2024, DOI: https://doi.org/10.1016/j.ijleo.2024.172010, (Impact factor: 3.1, Quartile Score: Q2)
31. Kumar, Virendra, Rajeev Kumar, Sarika Pal, and Yogendra Kumar Prajapati. "Development of surface plasmon resonance sensor utilizing GaSe and WS2 for ultra-sensitive early detection of dengue virus." Optik, vol. 313 pp. 171975 , October 2024, DOI: https://doi.org/10.1016/j.ijleo.2024.171975, 1 (Impact factor: 3.1, Quartile Score: Q2)
32. Veluchamy, Devika, Murugan Senthil Mani Rajan, and Yogendra Kumar Prajapati*. "Enhancing Breast Cancer Biomarker Detection with a Portable Biosensor Utilizing Flower Core Photonic Crystal Fiber Architecture." Plasmonics ,pp. 1-13, 07 August 24, DOI: https://doi.org/10.1007/s11468-024-02470-7, (Impact Factor 3.3 ,Quartile Score:Q3)
33. Daher, Malek G., Youssef Trabelsi, Ahmed Nabih Zaki Rashed, Ibrahim S. Yahia, Yogendra Kumar Prajapati, Abdulkarem HM Almawgani, and Ahmad Alzahrani. "Optical Sensitive Detection of Cervical Cancer Based on Surface Plasmon Resonance Nanostructure." physica status solidi (a) vol. 221, no. 16, pp. 2300567, July 2024, DOI: https://doi.org/10.1002/pssa.202300567(Quartile Score: Q3)
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35. Kumari, Sindhu, and Yogendra Kumar Prajapati*. "Refractive index sensor with extensive detection

range using photonic crystal fiber based on surface plasmon resonance." Journal of Optics , pp. 1-7, 19 June 2024, DOI: https://doi.org/10.1007/s12596-024-01974-z , (Impact factor:1.6 ,Quartile Score:Q3)

36. Kumar, Rajeev, Sajal Agarwal, Sarika Pal, Yogendra Kumar Prajapati, and J. P. Saini. "Enhanced refractive index sensing using a surface plasmon resonance sensor with heterostructure." Micro and Nanostructures, vol. 183 ,pp. 207656, 1 April 2024, DOI: https://doi.org/10.1016/j.micrna.2023.207656 (Impact factor 3.1 ,Quartile Score:Q2)
37. Agarwal, Sajal, Rajeev Kumar, Sarika Pal, Yogendra Kumar Prajapati, and J. P. Saini. "Magnesium fluoride and black phosphorus mediated long-range surface plasmon resonance biosensor for enhanced sensing of SARS-CoV-2 virus." Journal of Optics, pp. 1-13, 28 March 2024, DOI: https://doi.org/10.1007/s12596- 024-01772-7 (Impact Factor 1.6 ,Quartile Score:Q3)
38. Shukla, Prachi, Rajeev Tripathi, and Yogendra Kumar Prajapati*. "Analysis of an M-ary quadrature amplitude modulated underwater optical wireless communication system considering geometrical loss by laser, turbulence, and receiver diversity." Optical Engineering, vol. 63, no. 3 , pp. 038102-038102., 1 March 2024, DOI: https://doi.org/10.1117/1.OE.63.3.038102, (Impact factor 1.1 ,Quartile Score:Q2)
39. Kumar, Rajeev, Sarika Pal, Narendra Pal, Alka Verma, and Yogendra Kumar Prajapati. "MXene-Graphene MXene–Mediated Heterostructure-Based Surface Plasmon Resonance Sensor for the Detection of Leptospirosis Bacteria in Rodent Urine." Plasmonics, pp.1-11. , 28 February 2024, DOI: https://doi.org/10.1007/s11468-024-02246-z (Impact factor 3.3 ,Quartile Score:Q3)
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41. Yadav, Ajay Kumar, Pritam Keshari Sahoo, and Yogendra Kumar Prajapati "A companding approach for PAPR suppression in OFDM based massive MIMO system." Journal of Optical Communications, vol. 44, no. s1, pp. S1551-s1555, 13 February 2024, DOI: https://doi.org/10.1515/joc-2020-0255, (Quartile Score:Q3)
42. Kumar, Rajeev, Sajal Agarwal, Sarika Pal, Alka Verma, and Yogendra Kumar Prajapati. "Refractive index sensing using MXene mediated surface plasmon resonance sensor in visible to near infrared regime." Measurement , vol. 224, pp. 113682. 1 January 2024 DOI: https://doi.org/10.1016/j.measurement.2023.113682, (Impact factor 5.2 ,Quartile Score:Q3)
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Assisted Tunable Surface Plasmonic Resonance Sensor Using Machine Learning Model," Applied Phyics A, 129, 351 (2023). https://doi.org/10.1007/s00339-023-06630-0 (Impact factor: 2.983, Quartile Score: Q2)

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51. Palestine Malek G. Daher, Youssef Trabelsi; Y. K. Prajapati; Zbigniew Jaroszewicz; Abinash Panda; Naser M. Ahmed; Ahmed Nabih Zaki Rashed, "Highly Sensitive Detection of Infected Red Blood Cells (IRBCs) with Plasmodium Falciparum using Surface Plasmon Resonance (SPR) nanostructure," Optical and Quantum Electronics, 55, 199 (Jan.2023). https://doi.org/10.1007/s11082-022-04466-1 (Impact factor: 3, - Quartile Score: Q2)
52. Naghi Shaban; Yogendra Kumar Prajapati; Ramin Mohammadkhani, "Performance enhancement of waveguide-coupled and metamaterial surface plasmon resonance sensors based on Silver-Bismuth Ferrite and Graphene," Journal of Materials Science: Materials in Electronics, 34:309, January 25, 2023, https://doi.org/10.1007/s10854-022-09721-5 (Impact factor: 2.8, Quartile Score: Q2)
53. Vasile A. Popescu, K Chauhan, Yogendra Kumar Prajapati, and Anuj K. Sharma, "Design and analysis of graphene- and germanium-based plasmonic probe with photonic spin Hall effect in THz frequency region for magnetic field and refractive index sensing", Optical and Quantum Electronics, 55(2), 1-16, 2023 (Impact factor: 3, Quartile Score: Q2)
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57. Vipin Kumar Verma, Rajeev Kumar, Sarika Pal, Yogendra Kumar Prajapati, "Highly Sensitive MXene immobilized Long Range SPR Sensor for Biomolecule Detection," Optical Materials, Vol.133, November 2022, 112977, (Impact factor: 3.9, Quartile Score: Q1)
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