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<td>P-01</td>
<td><strong>Unfolding the Topological Charge of a Complex Field Through its Fourier-Bessel Transform</strong>&lt;br&gt;Monika Bahl and P. Senthilkumaran&lt;br&gt;<em>Physics Department, IIT Delhi Hauz Khas, India</em>&lt;br&gt;Abstract: We present a technique to determine the charge of a complex amplitude by extracting its Fourier-Bessel descriptors. The Cartesian signal is transformed to the polar frequency domain through the Fourier-Bessel Transform and analysed.</td>
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<td>P-02</td>
<td><strong>Composite Vortex Filters</strong>&lt;br&gt;Manoj Kumar Sharma, Joby Joseph, and Paramasivam Senthilkumaran&lt;br&gt;<em>Department of Physics, Indian Institute of Technology Delhi, New Delhi-110016 India</em>&lt;br&gt;Abstract: Superposition of two optical vortex beams form composite vortex beam and the characteristics of the resultant depend on the separation and the relative phases of the interfering vortex beams. We analyze these composite vortex filters.</td>
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<td>P-03</td>
<td><strong>Evaluation of Dammann Grating Using Polarization Interferometer</strong>&lt;br&gt;Vinu R.V¹, Manoj K. Sharma², Rakesh Kumar Singh¹, and P. Senthilkumaran²&lt;br&gt;¹Applied and Adaptive Optics Lab, Department of Physics, IIST, Trivandrum, Kerala, 695547, India&lt;br&gt;²Department of Physics, Indian Institute of Technology Delhi, New Delhi, 110016, India&lt;br&gt;Abstract: In this paper, generation of the Dammann grating by using the spatial light modulator (SLM) is discussed, and quality of the grating is examined by using the polarization interferometer and Fourier fringe analysis technique.</td>
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<td>P-04</td>
<td><strong>Vortices in Helico-Conical Beam and Fractional Vortex Beam</strong>&lt;br&gt;Brijesh Kumar Singh, D. S. Mehta, and P. Senthilkumaran&lt;br&gt;<em>Department of Physics, Indian Institute of Technology, Delhi, India-110016, India</em>&lt;br&gt;Abstract: The evolution of chain of uni-polar vortices in propagation of Helico-Conical beam plays an important role in shaping the helical amplitude profile in focal volume. This evolution is compared with that of fractional vortex beam.</td>
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<td>P-05</td>
<td><strong>Controlled Generation of the Periodic Polarization Structure by Interference</strong>&lt;br&gt;Brijesh Kumar Singh¹, Rakesh Kumar Singh¹, D. S. Mehta¹, and P. Senthilkumaran¹&lt;br&gt;¹Department of Physics, Indian Institute of Technology, Delhi, India-110016&lt;br&gt;Abstract: Controlled generation of the periodic polarization structure by interferometer is investigated. Periodic polarization structure is generated by interference of two spatially separated orthogonally polarized beams. Advantage of this technique is discussed and results are presented.</td>
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<td>P-06</td>
<td><strong>Effect of Birefringence of Flexible Substrate on the Polarization State of Backlight Source for Photonic Devices</strong>&lt;br&gt;Gyanendra Singh¹ and Dalip Singh Mehta²&lt;br&gt;¹Laser Applications and Holography Laboratory, Instrument Design Development Centre&lt;br&gt;²Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi -110016, India&lt;br&gt;Abstract: Birefringence of flexible substrate can affect the polarization of light passing through it causing the spectral change in LCDs. Aligning the optics axis of PET substrate in particular plane will not affect the polarization of backlight.</td>
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<td>P-07</td>
<td><strong>GMR-based PhC Biosensor Integrated with CCD</strong>&lt;br&gt;Jagadeesh Syamprasad¹, Roshni Narayanan¹, Rajeev Jindal², and Joby Joseph¹&lt;br&gt;¹Department of Physics, Indian Institute of Technology Delhi, New Delhi, India – 110016,&lt;br&gt;²Corporate R &amp; D, Moser Baer India Ltd, Greater Noida, India - 201 306&lt;br&gt;Abstract: We propose to fabricate a biosensor based on 1-D photonic crystal. With the integration of CCD sensor instead of a spectrometer, a cost-effective method for bimolecular detection can be devised.</td>
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| P-08 | **Effect of Helical Phase on the Optical Performance of Photonic Metamaterial Based Broadband Circular Polarizer**<br>Saraswati Behera and Joby Joseph<br>*Photonics Research Lab, Department of Physics, Indian Institute of Technology Delhi, New Delhi*
### Abstract: Broadband circular polarizer based on helical nanophotonic metamaterial structure is designed and the effect of phase between the intertwined helices on the optical performance is studied. The proposed polarizer can reach up to 50% more average extinction ratio in comparison to the in-phase polarizer.

### P-09. Modal Study of Silicon-Based Slot Waveguide Using Approximate Semi-vector Analysis

**Kanchan Gehlot and Anurag Sharma**  
**Department of Physics, Indian Institute of Technology, Delhi, India**  
**Abstract:** We present an approximate analysis of a vertical slot waveguide using semi-vector VOPT method. Effect of waveguide parameters on power confinement in the slot region is studied. Results show good agreement with rigorous numerical results.

### P-10. Beam Divergence for Index-Guiding Microstructured Optical Fibers

**Dinesh Kumar Sharma, Anurag Sharma, and Joby Joseph**  
**Physics Department, Indian Institute of Technology Delhi, New Delhi - 110016, India**  
**Abstract:** We analytically study the wavelength dependence of the beam divergence for a single-mode index-guiding microstructured optical fiber (MOF) and compare with available experimental results.

### P-11. Exploiting Microstructured Optical Fiber Platform for Generating Temporal Parabolic Pulse

1. **Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, 110016, India**  
2. **Institute of Radio Physics, Calcutta University, Kolkata, 700009, India**  
**Abstract:** All-fiber design approach for temporal parabolic pulse (PP) generation through a very short length of tapered microstructured optical fiber (MOF) is proposed. A length of just ~ 20 cm of designed MOF is shown to yield PP for a Gaussian input at 2 μm wavelength.

### P-12. Implementation of RI Sensor Using Biperiodic Waveguide Structure in Photonic Crystal

**Vinita Dahiya**, **Ajeet Kumar**, **Vipul Rastogi**, and **Ravindra Kumar Sinha**  
1. **Department of Applied Physics, Delhi Technological University, Delhi 110 442, India**  
2. **Department of Physics, Indian Institute of Roorkee, Roorkee, Uttrakhand 247 667, India**  
**Abstract:** Photonic crystal based biperiodic waveguide structure has been implemented for RI sensing. The proposed structure offers several advantages over conventional waveguide. The structure shows sensitivity of 300 nm/RIU with measurement range of 1.0 - 1.5.

### P-13. Design of a Highly Sensitive Micro-Displacement Sensor Based on Photonic Crystal Waveguides

**Himanshu Chauhan**, **Preeti Rani**, **Yogita Kalra**, and **R. K. Sinha**  
1. **Department of Applied Physics, Delhi Technological University, Bawana Road, Delhi, India**  
2. **Department of Mechanical Engineering, Delhi Technological University, Delhi, India**  
**Abstract:** A highly sensitive Micro-Displacement Sensor design consisting of 2D hexagonal PCWG arrangement of moving and fixed waveguides is created and its sensitivity is numerically simulated and estimated to be > 1.5 μm⁻¹.

### P-14. Two-Core Photonic Crystal Fiber with Zero Intermodal Dispersion at 1.064 μm Wavelength

**Than Singh Saini**, **Ajeet Kumar**, and **Ravindra Kumar Sinha**  
**TIFAC, Department of Applied Physics, Delhi Technological University, Delhi-110 042**  
**Abstract:** In two-core photonic crystal fibers intermodal dispersion may cause the distortion and breakup pulses propagating through it. In this work, we designed a two-core photonic crystal fiber for zero intermodal dispersion at 1.064 μm wavelength.

### P-15. Surface Enhanced Plasmonic Coupling via Localized Silver Nanoparticles Between Silicon Slabs

**Venus Dillu and Ravindra Kumar Sinha**  
**TIFAC, Department of Applied Physics, Delhi Technological University, Delhi, India**  
**Abstract:** We present surface enhanced plasmonic coupling through hexagonal silver nanoparticles sandwiched between silicon slabs. Periodicity of the nanoparticles and coupling length is optimized using computational methods. Plasmons assist signal routing and coupling within the waveguides.

### P-16. Design and Operation of Photonic Crystal Based AND Optical Logic Gate

**Preeti Rani**, **Yogita Kalra**, and **R. K. Sinha**  
**TIFAC, Department of Applied Physics, Delhi Technological University, Delhi, India**  
**Abstract:** We propose the design for AND optical logic gate. The design has been simulated using FDTD method and has a contrast ratio of 6.130 dB and bit rate of 0.664Tbit/s.

### P-17. Compact Design of Athermal Electro-Optic Modulator Based on SOI off-Axis Microring Resonator

**Rakim Haldar**, **Sanathanan M.S.**, **Abhik D. Banik**, and **S. K. Varshney**  
**Indian Institute of Technology Kharagpur, India-721302**.
Abstract: In this work, we propose and demonstrate the performance of Silicon-on-Insulator off-axis microring resonator as electro-optic modulator. Adding an extra off-axis inner-ring in conventional microring structure provides control to compensate thermal effects on electro-optic modulator.

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| P-18| **Large Mode Area Leakage Channel Fibers with Low Bending and Higher Differential Losses**  
Department of Electronics and Electrical Communication Engineering, IIT Kharagpur, India  
Abstract: Novel designs to achieve low bending and higher differential losses (>1000) in all-solid large-mode area leakage channel fibers with asymmetric-cladding structure for high-power applications are proposed. Superior characteristics are attained in comparison to existing structures. | G. Thavasi Raja and S. K. Varshney  
Department of Electronics and Electrical Communication Engineering, IIT Kharagpur, India |                                                                                                                                                                                                        |
| P-19| **Parametric Amplification Characteristics of Chalcogenide Photonic Crystal Fibers**  
1Department of Physics & Meteorology  
2Department of Electronics and Electrical Communication Engineering, IIT Kharagpur, India  
Abstract: A thermally tunable optical parametric amplifier with tunability of 300 nm is theoretically investigated in chalcogenide photonic crystal fiber of length 50 cm with single CW pump of power 5 W at ~2.94 μm. | S. P. Singh¹, S. K. Varshney¹,², and P.K. Datta¹  
¹Department of Physics & Meteorology  
²Department of Electronics and Electrical Communication Engineering, IIT Kharagpur, India |                                                                                                                                                                                                        |
| P-20| **Mid-IR Supercontinuum Generation In Chalcogenide-Core Step Index Fibers**  
Sheela C. S¹, Samudra Roy², and Shailendra K. Varshney¹,²  
¹Department of Electronics & Electrical Communication Engineering, IIT Kharagpur, India  
²Department of Physics and Meteorology, Indian Institute of Technology, Kharagpur, India  
Abstract: We propose the chalcogenide-core step index fiber for mid-IR supercontinuum generation. The core radius is optimized to get a wide spectrum (1200nm-5000nm) in a cm of fiber. We numerically simulate the spectral dynamics. | Sheela C. S¹, Samudra Roy², and Shailendra K. Varshney¹,²  
¹Department of Electronics & Electrical Communication Engineering, IIT Kharagpur, India  
²Department of Physics and Meteorology, Indian Institute of Technology, Kharagpur, India |                                                                                                                                                                                                        |
| P-21| **Modified Microring Resonator for Optical Interconnect Applications**  
Sanathanan M. S, Abhik D. Banik, Upendra Hatiya, and S. K. Varshney  
Department of Electronics and Electrical Communication Engineering, IIT Kharagpur, India  
Abstract: In this work we explore the tunability issues of off-axis micro ring resonator and response of tapered race-track MRR. The proposed structure of tapered race-track MRR can be used for athermal modulator circuits. | Sanathanan M. S, Abhik D. Banik, Upendra Hatiya, and S. K. Varshney  
Department of Electronics and Electrical Communication Engineering, IIT Kharagpur, India |                                                                                                                                                                                                        |
| P-22| **Orthogonal Solutions for SOI Waveguide Arrays: A Novel Approach**  
Niharika Kohli¹, Sangeeta Srivastava², and Enakshi K. Sharma¹  
¹Department of Electronic Science, University of Delhi South Campus, New Delhi, India  
²Rajdhani College, University of Delhi, New Delhi-110015, India  
Abstract: A unique methodology is presented for obtaining accurate orthogonal modal solutions for high index contrast Silicon on Insulator Waveguide Arrays. The Ritz Galerkin Variational procedure wherein the orthogonal basis set is obtained using the Gram Schmidt orthogonalization is presented. | Niharika Kohli¹, Sangeeta Srivastava², and Enakshi K. Sharma¹  
¹Department of Electronic Science, University of Delhi South Campus, New Delhi, India  
²Rajdhani College, University of Delhi, New Delhi-110015, India |                                                                                                                                                                                                        |
| P-23| **Regeneration of Gaussian Temporal Pulse Sequence in a Coaxial Optical Fiber - Occurrence of ‘Talbot Effect’ in Time Domain**  
Enakshi K. Sharma¹ and Jyoti Anand²  
¹Department of Electronic Science, University of Delhi South Campus, Delhi-110021, India  
²Keshav Mahavidyalaya, University of Delhi, Delhi 110034, India  
Abstract: A coaxial fiber of chosen length, supporting two symmetric modes (LP₀₁ and LP₂₀), excited by periodic sequence of Gaussian temporal light pulses of chosen repetition rate, regenerates original pulse sequence “Talbot Effect” in time domain. | Enakshi K. Sharma¹ and Jyoti Anand²  
¹Department of Electronic Science, University of Delhi South Campus, Delhi-110021, India  
²Keshav Mahavidyalaya, University of Delhi, Delhi 110034, India |                                                                                                                                                                                                        |
| P-24| **Design and Simulation of Plasmonic MIM Slot Waveguide Based Dualband Band Pass Filter**  
K.Thirupathaiah¹,², Brijesh Iyer¹, Nagendra P. Pathak³, and Vipul Rastogi³  
¹(RFIC) Research Laboratory Department of Electronics and Communication Engineering  
²Indian Institute of Technology Roorkee-Uttarakhand-India-247667  
Abstract: This paper reports simulation of nanoplasmonic MIM stepped width resonator (SWR) based BPF having two resonators and a dual band impedance inverter. Simulation results confirm the presence of pass bands at 1350-nm and 1650-nm. | K.Thirupathaiah¹,², Brijesh Iyer¹, Nagendra P. Pathak³, and Vipul Rastogi³  
¹(RFIC) Research Laboratory Department of Electronics and Communication Engineering  
²Indian Institute of Technology Roorkee-Uttarakhand-India-247667 |                                                                                                                                                                                                        |
| P-25| **Slot Optical Waveguide Dispersion Compensator**  
Nandam Ashok and Vipul Rastogi  
Department of Physics, Indian Institute of Technology Roorkee, Roorkee 247 667, India  
Abstract: We present slot waveguide design for dispersion compensation. Using the present design we | Nandam Ashok and Vipul Rastogi  
Department of Physics, Indian Institute of Technology Roorkee, Roorkee 247 667, India |                                                                                                                                                                                                        |
achieved a GVD of 7.2×10−25 s²/mm. The design should be useful in integrated optic waveguide lasers.

| P-26. | **Efficiency Enhancement in the Thin Film GaAs Solar Cell Using Photonic Crystal as a Back Reflector**  
Nikhil Deep Gupta and Vijay Janyani  
Electronics and Communication Engineering Department, MNIT, Jaipur, India  
Abstract: We are proposing a method for single-junction thin-film GaAs solar cell using PhC (GaAs rods having SiO2 in the background) as back-reflecting mirror, which has improved absorption and ultimately efficiency. |
| P-27. | **Supercontinuum Generation in All-Solid Photonic Crystal Fiber**  
Manish Tiwari† and Vijay Janyani‡  
†Rajdhani Engineering College, Jaipur, Rajasthan, India  
‡Malaviya National Institute of Technology, Jaipur, Rajasthan, India  
Abstract: We propose a lead silicate all–solid photonic crystal fiber which exhibits enhanced nonlinearity and very flat and near-zero dispersion in anomalous region and is suitable for broadband supercontinuum with 50 fs-2 kW pulses pumped at 1.55 μm. |
| P-28. | **Trade-off Between Impairment Awareness and Power Economy in Optical WDM Networks**  
Rahul Jashvantbhai Pandya¹, Vinod Chandra², and D.Chadha²  
¹Bharti School of Telecommunication Technology and Management,  
²Electrical Engineering Department, Indian Institute of Technology, Delhi New Delhi, India  
Abstract: To achieve Power Economy (PE), transparency is introduced which lacks in signal regeneration. This, results in noise accumulation due to the impairments. The trade-off between PE and Impairment Awareness (IA) is simulated in OptSim. |
| P-29. | **Polarization Characteristics of Metal Filled Suspended Core Photonic Crystal Fiber**  
Tushar Biswas, Surajit Bose, Rik Chattopadhyay, and Shyamal K. Bhadra  
CSIR-CGCRI, 196 Raja S. C. Mullick Road, Jadavpur, Kolkata, India  
Abstract: We present the study of polarization characteristics of metal filled suspended core photonic crystal fiber. The numerical calculation shows that modal birefringence increases with the increase in dispersion factor of the metal filled air hole. |
| P-30. | **Effect of Dispersion on Supercontinuum Generation of Suspended Core Photonic Crystal Fiber**  
Surajit Bose, Rik Chattopadhyay, M. Pal, and S. K. Bhadra  
Fiber Optics and Photonics Division CSIR-Central Glass and Ceramic Research Institute  
Abstract: Supercontinuum generation in suspended core photonic crystal fiber is experimentally reported pumped with picosecond pulse at 30 mW. Three different dimensions of fabricated fibers with distinct dispersion properties are employed to generate broadband white light source. |
| P-31. | **Performances of Ring-Shaped Cladding Structured PCF Laser and Triangular-Lattice PCF Laser**  
Kajal Mondal and Partha Roy Chaudhuri  
Department of Physics & Meteorology, IIT-Kharagpur, 721302, India  
Abstract: We perform a detailed study on erbium-doped ring shaped cladding structured photonic crystal fiber (PCF) laser towards achieving high performance fiber laser. We achieve a better lasing performance as compared to triangular-lattice PCF. |
| P-32. | **Geometrical Parameters Dependence Towards Ultra-Flat Dispersion Square-Lattice PCF Using Tunable Liquid Infiltration**  
Partha Sona Maji and Partha Roy Chaudhuri  
Department of Physics and Meteorology, Indian Institute of Technology, Kharagpur, India.  
Abstract: Structural dependence of PCF parameters towards ultra-flat dispersion in the C band of communication wavelength has been investigated and D = 0±0.58 ps/(nm-km) over a bandwidth of 622 nm in the communication wavelength band (C-band) has been achieved. |
| P-33. | **Smooth Supercontinuum Generation in Dispersion-Flattened Nonlinear High-Index-Core Bragg Fiber**  
Sudip K. Chatterjee, Saba N. Khan, and Partha Roy Chaudhuri  
Department of Physics and Meteorology, Indian Institute of Technology, Kharagpur, India  
Abstract: An efficient Supercontinuum generation in High-Index-Core Bragg Fiber under all-normal group velocity dispersion regime is demonstrated. The Full-vector-mode formulation is utilized to obtain ultra-flattened dispersion profile; a stable and spectrum-width of 400 nm is achieved. |
| P-34. | **Experimental Investigation of Redistributed Photon-DOS in Metal-Dielectric Photonic Crystals**  
Sriram Guddala¹, G. Vijaya Prakash², and D. Narayana Rao³  
¹Malaviya National Institute of Technology, Jaipur, Rajasthan, India  
²Electrical Engineering Department, Rajdhani Engineering College, Jaipur, Rajasthan, India  
³Department of Electronics and Communication Engineering, MNIT, Jaipur, Rajasthan, India  
Abstract: We present the study of polarization characteristics of metal filled suspended core photonic crystal fiber. The numerical calculation shows that modal birefringence increases with the increase in dispersion factor of the metal filled air hole.
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<td>We have studied the spatial intensity distribution of optical vortex beams both theoretically and experimentally. We show that the area of the bright ring present in optical vortex increases with its order along with the inner and outer radii of the vortex beams.</td>
<td>Probing Spatiotemporal Optical Complex Functionality of Photonic Systems</td>
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<td>Adding a suitable homogeneous background in the expression for widths of the self-similar solutions which is achievable through the modulation of tapering profile, we could avert the collapse of self-similar waves in tapered graded-index waveguide.</td>
<td>Design of Terahertz Radio over Fiber – Beyond 4G</td>
<td>Sai Venkatesh, B., Ganapathy, R., and Porsezian, K.</td>
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<td>We design a silicon nanowire embedded spiral photonic crystal fiber exhibiting a flattened dispersion, a large anomalous dispersion, a small third order dispersion and a high nonlinearity and demonstrate supercontinuum generation at visible wavelength.</td>
<td>Supercontinuum Generation in a Silicon Nanowire Embedded Spiral Photonic Crystal Fiber</td>
<td>E. Gunasundari, K. Senthilnathan, S. Sivabalan, K. Nakkeeran, and P. Ramesh Babu</td>
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<td>A high birefringent photonic crystal fiber is designed using circular and elliptical air holes. The birefringence value reaches the magnitude of $10^{-3}$ at 1550 nm which is required for high precision applications in optical systems.</td>
<td>Design of High Birefringence Nonlinear Polarization Maintaining Photonic Crystal Fiber</td>
<td>Sneha Sharma and Jitendra Kumar</td>
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<td>We propose a six fold solid-core photonic quasicrystal fiber for studying optical properties for wavelengths from 200 to 3000 nm and demonstrate a low dispersion and high nonlinearity at 1060 nm for few-cycle pulse generation.</td>
<td>Low Dispersion and High Nonlinearity Microstructured Photonic Quasicrystal Fiber</td>
<td>M. S. Aruna Gandhi, S. Sivabalan, P. Ramesh Babu, K. Nakkeeran, and K. Senthilnathan</td>
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<td>Enhanced optical field strengths result from redistributed photon DOS of 3D and 1D metal-dielectric photonic crystals are probed through wavelength scanned and angle resolved Raman scattering studies. The results are supported by electric field confinement simulations.</td>
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<td>We experimentally and numerically probe the optical complexity in space and time with two different photonic test-bed: (i) delay-coupled diode lasers system and (ii) quasi-ordered natural photonic structures on the transparent insect wings for the realization of complex photonic integrated circuit on the chip scale.</td>
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<td>Effective Mode Area Enhancement in a Defected Core Photonic Crystal Fiber</td>
<td>Shashi Kant Pandey(^1) and Yogita Kalra(^2)</td>
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<td>S. Mondal(^1), S. P. Singh(^1), S. Mukherjee(^1), A. Date(^1), S. Mukhopadhyay(^2) and P. K. Dutta(^1)</td>
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<td>Propagation Characteristics of Solid Defect-Core W-Type PCF</td>
<td>Jiten Boruah</td>
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<td>All-Optical Ultrafast Reconfigurable Logic Unit with Silicon Microring Resonators</td>
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<td>Vulnerability of Asymmetric Cryptosystem Based on Spherical Wave Illumination</td>
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