Special Issue

Advancements and Future Perspectives in All-Optical Detection and Reliability Improvement Technologies

Message from the Guest Editor

With the rapid development of bandwidth-intensive applications, optical networks have experienced a substantial increase in traffic. Theseoptical networks are highly vulnerable to security threats such as eavesdropping and attacks. Photonic firewalls can perform data identification and intrusion detection directly at the optical layer. However, we continue to face the following challenges: First, SOA-based matching structures are unable to achieve all-optical matching at 40G and higher rates. In addition, there is a lack of matching structures for high-order modulation formats and existing structures that are suitable for amplitude signals. Furthermore, there is a lack of matching models for arbitrary modulation formats, where each modulation format corresponds to a set of matching structures. Lastly, the existing matching structures cannot handle the impact of system noise on matching, limiting the application of the current structures. These challenges highlight the need for further in-depth research to develop more effective solutions.

- optical network security
- all-optical fast matching
- all-optical logic gates
- optical network reliability
- reliability evaluation

Guest Editor

Dr. Xin Li

School of Electronic Engineering, Beijing University of Posts and Telecommunications, Beijing 100876, China

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Photonics
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
photonics@mdpi.com

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Prof. Dr. Nelson Tansu
School of Electrical and Electronic Engineering (EEE), The University of Adelaide, Adelaide, SA 5005, Australia

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