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标题: Advanced millimeter-wave security portal imaging techniques

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摘要: Millimeter-wave (mm-wave) imaging is rapidly gaining acceptance as a security tool to augment conventional metal detectors and baggage x-ray systems for passenger screening at airports and other secured facilities. This acceptance indicates that the technology has matured; however, many potential improvements can yet be realized. The authors have developed a number of techniques over the last several years including novel image reconstruction and display techniques, polarimetric imaging techniques, array switching schemes, and high-frequency high-bandwidth techniques. All of these may improve the performance of new systems; however, some of these techniques will increase the cost and complexity of the mm-wave security portal imaging systems. Reducing this cost may require the development of novel array designs. In particular, RF photonic methods may provide new solutions to the design and development of the sequentially switched linear mm-wave arrays that are the key element in the mm-wave portal imaging systems. High-frequency, high-bandwidth designs are difficult to achieve with conventional mm-wave electronic devices, and RF photonic devices may be a practical alternative. In this paper, the mm-wave imaging techniques developed at PNNL are reviewed and the potential for implementing RF photonic mm-wave array designs is explored.

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