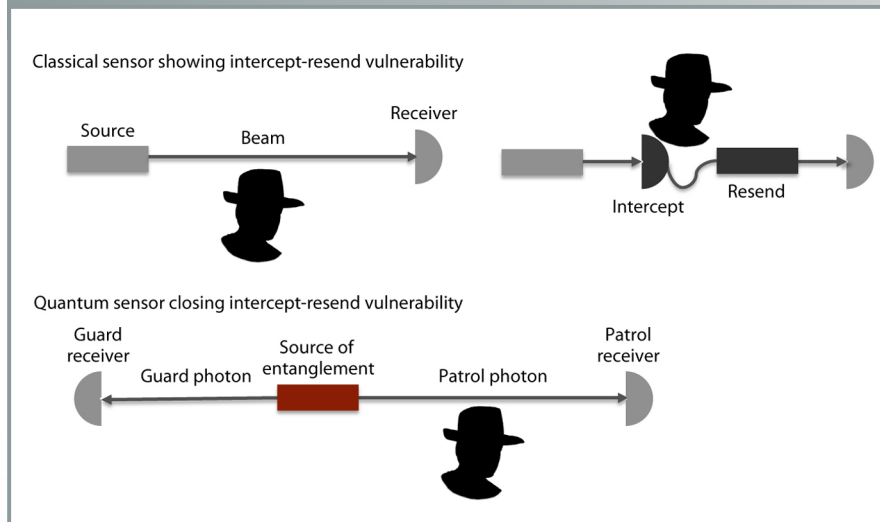


An Intrusion Detection System Using Quantum-Mechanical Systems

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Technology Summary

Securing property and communication boundaries is critical for sensitive sites like nuclear and chemical facilities and military bases, as well as other places where valuable goods are stored. ORNL researchers used a quantum mechanics approach to develop a device that detects intrusion across a physical boundary or communication links.

Conventional intrusion detectors are based on classical physics: They are composed of an electrical field transmitted along a path marking the boundary to be monitored. Consequently, it is possible to create a perfect copy, or counterfeit, of this electrical field. An intruder with a copying/retransmitting device can create a counterfeit to infiltrate the monitored boundary.

Avoiding this vulnerability, the invention includes a quantum-mechanically entangled system of two or more quantum-physical subsystems. This technology makes it impossible for a counterfeit copy to be produced. Additionally, the invention can detect when an intruder is attempting to counterfeit the system.

Advantages

- Prevents counterfeiting attacks on an intrusion monitored area
- Detects when an intruder is attempting to counterfeit the monitoring system

Potential Applications

- Physical boundary intrusion detection
- Communication link intrusion detection

Patent

Travis S. Humble, Ryan S. Bennink, and Warren P. Grice, *Tampering Detection System Using Quantum-Mechanical Systems*, U.S. Patent US 8,077,047, issued December 13, 2011.

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