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**Explosives Detection: Exploitation of the Physical Signatures**

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Explosives based terrorism is an ongoing threat that is evolving with respect to implementation, configuration and materials used. There are a variety of devices designed to detect explosive devices, however, each technology has limitations and operational constraints. A full understanding of the signatures available for detection coupled with the array of detection choices can be used to develop a conceptual model of an explosives screening operation. Physics based sensors provide a robust approach to explosives detection, typically through the identification of anomalies, and are currently used for screening in airports around the world. The next generation of detectors for explosives detection will need to be more sensitive and selective, as well as integrate seamlessly with devices focused on chemical signatures. An appreciation for the details of the physical signature exploitation in cluttered environments with time, space, and privacy constraints is necessary for effective explosives screening of people, luggage, cargo, and vehicles.