

III. Device Concepts & Sensor/System Functionality

(B1) Novel Signature Mechanisms & Recognition Techniques

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The intent of this session is to accommodate broad spectrum of frontier research and advanced device and system concepts from fundamental science to engineering design. Therefore, proposers are encouraged to submit novel sensing device and/or system concepts. The goal of the session is to identify new or underexplored or novel combinations of common signature mechanisms, based on molecular emission, absorbance, vibration, rotation, translation, rapid reaction chemistries or molecular recognition having applications in the development of advanced sensors to supplement or supplant current systems, or provide new and innovative frontline techniques. Currently, there are well-recognized sensor mechanisms based on fluorescence, absorbance, and impedance, as well as mass spectrometric and photoacoustic methodologies. Each methodology has advantages and limitations that include cost, sensitivity, resolution, speed, lifetime, robustness in harsh environments, contamination by exogenous compounds, rate of false positives, range for detection, energy requirements, size, portability and simplicity of operation. Therefore, novel sensing mechanisms and recognition techniques for hard-to-assess or newly recognized threats (such as TATP explosives) which have minimal absorbance, fluorescence or molecular recognition patterns, are of particular interest in this session.