Ambient Detection of Energetic Materials by Matrix Assisted Laser Desorption and Photofragmentation-Fragment Detection STEPHEN ROBERSON[1], ROSARIO SAUSA, US Army Research Laboratory — We detect energetic materials TNT and RDX by Matrix Assisted Laser Desorption (MALD) followed by photofragmentation-fragment detection (PF-FD) in real time at ambient conditions. A pump laser irradiates a mixture of energetic material and laser dye freeing the energetic material from the surface, and a second laser fragments the resulting energetic molecule to create the characteristic nitric oxide (NO) fragment, which is subsequently ionized and then detected by resonance-enhanced multiphoton ionization (REMPI). Our studies on the effects of pump and probe laser energy, dye concentration, and analyte concentration on the ion signal intensity, as well as the RDX and TNT limits of detection will be reported at the meeting. The PF-FD technique exhibits great potential for detecting trace energetic materials on surfaces because of its high sensitivity and selectivity. It is not restricted to TNT and RDX, and can be extended to other energetic materials.

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