CORE
Metadata, citation and similar papers at core.ac.uk
Provided by Illinois Digital Environment for Access to Learning and Scholarship Repository

TERAHERTZ ANALYTICAL CHEMICAL SENSING OF EXPIRED HUMAN BREATH.

DANIEL J TYREE, HANNAH N BENSTON, *Department of Physics, Wright State University, Dayton, OH, USA*; PARKER K HUNTINGTON, *Department of Physics, MIT, Cambridge, MA, USA*; BRENT D FOY, IVAN MEDVEDEV, *Department of Physics, Wright State University, Dayton, OH, USA*.

We report on our recent research on applying Terahertz molecular sensing to quantitative analysis of human breath. A recently developed tabletop THz gas sensor has been demonstrated to detect a range of breath volatiles at a part per billion/trillion level of dilution. In a recent project we developed several statistical models of fatigue based on THz analyses of expired human breath. Breath of ten subjects was sampled over the course of a 40-hour sleep deprivation study performed by Navy Medical Research Unit – Dayton (NAMRU-D) at Wright Patterson Air Force Base. The breath-fatigue models presented here predict the reaction times measured by Psychomotor Vigilance Task test along the timeline of sleep deprivation study. This promising application of THz gas sensing hold a lot of potential for a range of civilian and military applications.