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Optogalvanic spectroscopy: Towards a versatile plasma based tool for gas trace analysis[1] LINA M. HOYOS-CAMPO, A.M. JUAREZ, Instituto de Ciencias Fisicas, Universidad Nacional Autonoma de Mexico, P.O Box 43-8, Cuernavaca, Morelos, 62251, Mexico — The real-time detection and quantification of molecular traces in atmospheric samples is currently a very active field in medical, homeland security and biological applications. The optogalvanic effect consists in the variation in the electrical properties of a plasma, induced by the interaction of resonant radiation with atoms or molecules present in it. This technique provides a very sensitive and selective spectroscopic tool for gas trace analysis. However, optogalvanic spectroscopy is not currently being exploited thoroughly, in our opinion, in these applications. In the present contribution we will discuss our current efforts towards developing a molecular trace detection facility focused on gas phase volatile compounds (VOC) detection using optogalvanic spectrometry. Our spectrometer consists of a hollow cathode discharge coupled to tunable lasers in the visible (400-800 nm) and mid-infrared, Quantum Cascade Laser (8000 to 10000 nm) spectral range. In particular we will present our preliminary results in the associative ionization induced in a helium (James Lawler, Phys. Rev. A. 22, 3, 1980), as well as an outlook of future work in this emerging area of medical and biological application of gas trace analysis based on optogalvanic spectrometry.

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