

# LIDAR DIRECTORY FORM

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LIDAR LOCATION (CITY, COUNTRY, LAT., LONG.): Murcia (Spain).  
38° 1' 15'' N, 1° 9' 56'' W.

SITE ELEVATION: 90 meters.

PARAMETER(S) OR CONSTITUENT(S) MEASURED: Atmospheric extinction and backscatter coefficients (elastic and Raman), water vapor (Raman), atmospheric contaminants (DIAL).

RESEARCH OBJECTIVES AND SPONSOR: Determination of vertical and horizontal profiles of atmospheric parameters and atmospheric pollution over the city of Murcia. University of Murcia.

## MEASUREMENT TECHNIQUE:

- Elastic channel: Backscattering at 1064, 532 and 355 nm. Klett-Fernald algorithm.
- Raman channel: Irradiation with 355 nm, detection at 376 nm (O<sub>2</sub>), 387 nm (N<sub>2</sub>) and 408 nm (H<sub>2</sub>O). Ansmann algorithm.
- DIAL: Irradiation using OPO in visible and UV region, mean power of 50 mJ in the 400-700 nm region and about 5 mJ in the 200-400 nm region. Detection using ½ meter polychromator. DIAL algorithm.

MEASUREMENT RANGE: 50 km max (depending on technique).

VERTICAL RESOLUTION: 45 m typically (depending on range).

FREQ. OF MEASUREMENT (TYPICALLY): Not programmed.

MEASUREMENT TIMES (TYPICALLY): 10 - 20 min typically (depending on technique).

LASER TYPE AND WAVELENGTH (s): Nd:YAG, 1064, 532, 355 and 266 nm.

LASER ENERGY/PULSE: 1000 mJ (1064 nm), 500 mJ (532 nm), 250 mJ (355), 110 mJ (266 nm).

PULSE REPETITION RATE: 10 Hz

RECEIVER SIZE AND CONFIGURATION: 35 cm Schmidt-Cassegrain telescope.

DETECTORS USED: CVI ½ m monochromator equipped with UV, visible and near IR gratings and Peltier cooled Hamamatsu 943-02 photomultiplier.

SIGNAL PROCESSING: Stanford Research Systems gated integrator and boxcar averager with 4 channel amplifier for analogic detection. Stanford Research Systems SR400 gated photon counter for photon counting.

ANALOG-TO-DIGITAL CONVERTER: SRS computer interface module.

COMPUTER: PC compatible.

PLATFORM: Daedal – Compumotor for transmitter. Meade platform for telescope receiver.

PUBLICATIONS (5 recent and/or significant):

J. Zúniga, A. Bastida, M. Alacid y A. Requena. Título: Global Potential Energy Surfaces for the CO<sub>2</sub> and CS<sub>2</sub> Molecules. Revista: Chemical Physics Letters, 313, 670-678 (1999).

A. Vázquez, J. M. Bolarín. A. Bastida, J. Zúniga, L. M. Tomás Balibrea y A. Requena  
Título: El láser en el control de la contaminación atmosférica y en la detección de entornos de navegación de robots Libro: Química en Murcia 2002. Editores: A. Bódalo, E. Gómez y M.F. Máximo, Servicio de Publicaciones de la Universidad de Murcia. Murcia (2002).

J. Zúniga, A. Bastida, A. Requena y E. L. Sibert III. Título: A Theoretical Study of the Vibrational Spectrum of the CS<sub>2</sub> Molecule. Revista: Journal of Chemical Physics, 116, 7495-7508 (2002).

J. Zúñiga, A. Bastida y A. Requena. Título: Theoretical calculations of vibrational frequencies and rotational constants of the N<sub>2</sub>O isotopomers. Revista: Journal of Molecular Spectroscopy, 217, 43-58 (2003).

A. Vazquez Palazón, A. Baeza Caracena, M.E. Requena Candela, M. Sánchez López, J.M. Bolarín Guillén, A. Bastida Pascual, J. Zúñiga Román, L.M. Tomás Balibrea, E. González Ferradás, E. Buitrago Martínez, J. Ruiz Gimeno, M. Doval Miñarro, A. Miñana Aznar y A. Requena Rodríguez. Título: Irradiación solar, ozono y contaminación urbana en municipios de la Región de Murcia. Edición 2003 y edición de 2005. Consejería de Industria y Medio Ambiente. Dirección General de Calidad Ambiental. Última edición Noviembre 2005.

COMMENTS:

PICTURES:



