Francisco Valero

Department of Astrophysics and Atmosphere Physics
Facultad de Ciencias Físicas
Universidad Complutense
Plaza de Ciencias, 28040 Madrid, Spain
Teléfono: +34 913944520.
Email: valero@fis.ucm.es

Proposed Role in Metnet

To perform a comprehensive research of the Martian Planetary Boundary Layer (MPBL). From in situ data measured by Vikings, Pathfinder, Mars Exploration Rover, and Phoenix missions, and with the help of a microscale MPBL model, the turbulent kinetic energy budget, both in the first meters and in the bulk of the MPBL, will be characterized. Thus, values for the mechanisms creating and destroying turbulence (shear, convection, dissipation, transport...) will be determined, allowing us to distinguish which mechanisms rule the MPBL as a function of time and height.

In addition, we will study the diurnal interchange of water vapor between the regolith and the first meters of the Martian atmosphere by coupling a regolith model to the 1d microscale model. This interchange is still poorly understood, though expected to play a key role in the water vapor cycle.

Education

Degree in Physics. Complutense University of Madrid, 1975

Graduate in Optics. Complutense University of Madrid, 1979

Ph.D. in Physics. Complutense University of Madrid, 1980

Academic Work Experience

1975-1984: Assistant Professor at the Department of Astrophysics and Atmosphere Physics in the Faculty of Physics (Complutense University of Madrid)

Lecturer: Air Physics

1984-Present: Associate Professor at the Department of Astrophysics and Atmosphere Physics in the Faculty of Physics (Complutense University of Madrid)

Lecturer: Dynamic Meteorology and Atmospheric Radiation

1986-Present: Visiting Professor of WMO Personal Training Courses Class II

Visiting Scientist

University of California in Riverside (UCR): 1977

University of California in Los Angeles (UCLA): 1977

La Sapienza University of Rome: 1997

1998-Present: Director of the Master on Climate-related Risks and Environmental Impact (Complutense University of Madrid/Spanish Meteorological Agency)

Recent Main Publications

Valero, F., M. Y. Luna, M. L. Martín, A. Morata, F. González-Rouco, 2004: Coupled modes of large-scale climatic variables and regional precipitation in the Western Mediterranean in autumn, *Climate Dynamics*, 22, 307-323

M.G. Sotillo, A. W. Ratsimandresy, J. C. Carretero, A. Bentamy, F. Valero, J. F. González-Rouco: 2005: A high-resolution 44-year atmospheric hindcast for the Mediterranean Basin: contribution to the regional improvement of global reanalysis, *Climate Dynamics*, 25, 219-236

M. G. Sotillo, M. L. Martín, F. Valero and M. Y. Luna, 2006: Validation of an homogeneous 41-year (1961-2001) winter precipitation hindcasted dataset over the Iberian Peninsula: assessment of the regional improvement of global reanalysis, *Climate Dynamics*, 27, 627–645

A. Morata, M. L. Martín, M. Sotillo, F. Valero and M. Y. Luna, 2008: Iberian autumn precipitation characterization through observed, simulated and reanalysed data, *Advances in Geosciences*, 16, 49-54.

F. Valero, M.L. Martín, M.G. Sotillo, A. Morata and M. Y. Luna, 2009: Characterization of the autumn Iberian precipitation from long-term data sets: comparison between observed and hindcasted data, *Internatinal Journal of Climatology*, 29, 527-541.

G. M. Martínez, F. Valero, L. Vázquez, 2009: Characterization of the Martian Surface Layer, *Journal of Atmospheric Sciences*, 66, 187-198.

G. M. Martíınez, F. Valero, L. Vázquez, 2009: Characterization of the Martian Convective Boundary Layer, *Journal of Atmospheric Sciences*, 66, 2044-2058.