



CURRICULUM VITAE (CVA)

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

Part A. PERSONAL INFORMATION

CV date 23/05/2023

PERSONAL INFORMATION			
First name	Rafael		
Family name	López Luque		
Gender (*)	Male	Birth date (dd/mm/yyyy)	--/--/----
Passport, ID number	----- -		
e-mail	Fa1lolur@uco.es	URL Web: https://www.uco.es/investiga/grupos/fisicayrenovables/	
Open Researcher and Contributor ID (ORCID) (*)		0000-0003-1963-0523	

(*) Mandatory

A.1. Current position

Position	Full professor		
Initial date	15/05/2018		
Institution	University of Córdoba		
Department/Center	Applied Physics		
Country		Teleph. Number	+34957218401
Key words			

A.2. Previous positions (research activity interruptions, art. 14.2.b))

Period	Position/Institution/Country/Interruption cause
1993-1995	Profesor Titular de Escuela Universitaria(Interino)
1995-2018	Profesor Titular de Universidad

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Licensed Agronomic Engineering	University of Córdoba	1989
PhD Agronomic Engineering	University of Córdoba	1993
Licensed Physical Sciences	UNED	2007

Part B. CV SUMMARY (max. 5000 characters, including spaces)

The developed research has been centered on three main lines:

Line1. Use of solar energy

This line has been initiated and promoted thanks to the direction of several Doctoral Theses in which the availability of the solar resource for its use in photovoltaic installations is studied.

Remarkable results are:

- A precise sizing method for photovoltaic installations to supply seasonally variable energy demands. Currently, the extension of this method is being studied for installations that are not oriented towards the South or that have to be located in places with shading conditions nuevo resultados
- An extended methods to characterize the influence of solar obstructions on solar irradiation over tilted surfaces.
- Different methods to characterize an ameliorate the strategies of solar tracking-baktracking in solar photovoltaics facilities.

Line 2. Use of irrigation water in agriculture.

There are multiple academical (Doctoral Theses, Professional End-of-Degree Jobs, and technological contracts) related with this line aimed at obtaining optimal design methodologies for irrigation facilities. These methodologies have had a high scientific impact, reflected in various publications, such as social, as they have been the object of demand for technical reports from Public Institutions and private companies that are interested in applying the algorithms developed to the irrigation networks on which they work. This work has been done on the characterization of water and energy consumption in Andalusian irrigation, as well as the establishment of strategies that lead to their optimal use. In this field, the application of techniques such as Benchmarking, study of Management indicators or Data Envelopment Analysis (Data Envelopment Analysis) has given rise to novel works that have allowed a better understanding of the structural characteristics of Irrigation Communities and the effects of the Modernization of these in saving water. In the last decade this research line of energy saving in irrigated agriculture has been connected with the first of the lines presented regarding photovoltaic solar energy, since photovoltaic irrigation is presented as an option for the future in agricultural development. New concepts as 'Opportunity Irrigation' or collective photovoltaics irrigation methods on this area have been developed and published and extensively cited.

Line 3. Technological developments on the base of above mentioned lines.

The know-how adquired in the abovementioned line has produced: a) a patent and commercial exploitation of an optimized Fresnel concentrator based on a simplified mechanism that allows the coordinated movement with only one electric motor. B) the theoretical development, prototyping and patent of a heliostat whose design allows the activation of multiple heliostatic units with a single motor (The ones currently used require two motors per heliostat). c) a patent related with the solar incidence on electric vehicles d) design and development of a new omnidirectional irradiance sensor based on free hardware and software e) optimized photovoltaic water heater for domestic use.

In recent years these lines have borne fruit, as shown by the more than ten articles indexed by JCR in the first quartile, thanks to the development of innovative methodologies that have allowed the characterization and optimization of the geometric use of the land by photovoltaic trackers. These methodologies are of great use for the study of agrivoltaic installations as they allow the optimization of the use of solar radiation and its optimal distribution between agricultural and electrical use.

Remarkable index-based results are:

- 34 papers published in JCR indexed journals in the last 10 years with 975 cites (Scopus)
- 92.5 cites/year in last 10 years (Scopus)
- h-index 21 (Scopus).
- Normalized Impact Index: 1.408224
- 79% of published articles in last 5 years have been cited
- More than 80% of indexed JCR papers since 2019 have been published in open access
- 5 six-year research recognitions
- 4 Patents
- 25 papers published in non JCR indexed journals.
- 18 Projects or contract for research
- 18 Contracts aimed to technical services
- 116 papers in congress
- 13 Directed and co-supervised doctoral theses (17 JCR articles have been derived from them and a high rate of professional success of the supervised students)
- 72 Directed and co-supervised master theses

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions)

Publicación en Revista. Casares de la Torre F.J., Varo-Martínez M., López-Luque R., Ramírez-Faz J., Fernández-Ahumada. M. 2022. DESIGN AND ANALYSIS OF A TRACKING / BACKTRACKING STRATEGY FOR PV PLANTS WITH HORIZONTAL TRACKERS AFTER

THEIR CONVERSION TO AGRIVOLTAIC PLANTS. Renewable Energy. In progress. (Base de datos de indexación: JCR 2021 N° de citas: 5 Posición en la categoría categoría ENERGY & FUELS 25/119 Índice de impacto: 8.63)

Publicación en Revista. Fernández-Ahumada, L.M., Ramírez-Faz, J., Torres-Romero, M., López-Luque, R.. 2019. PROPOSAL FOR THE DESIGN OF MONITORING AND OPERATING IRRIGATION NETWORKS BASED ON IOT, CLOUD COMPUTING AND FREE. Sensors. 19: 279-286. (Base de datos de indexación: JCR 2019 N° de citas: 39 Posición en la categoría INSTRUMENTS & INSTRUMENTATION Q1: 14 / 64 Índice de impacto: 3.576)

Publicación en Revista. Zavala V.,López-Luque R.,Reca J.,Martínez J.,Lao M.T.. 2020. OPTIMAL MANAGEMENT OF A MULTISECTOR STANDALONE DIRECT PUMPING PHOTOVOLTAIC IRRIGATION SYSTEM. Applied Energy. 260: 159-168. (Base de datos de indexación: JCR 2020 N° de citas: 13; Posición en la categoría ENERGY & FUELS D1 9/114 Índice de impacto: 9.746)

Publicación en Revista. Rodríguez, Daniel; Reca-Cardena, Juan; Martinez-Lopez, Juan; Lopez-Luque, Rafael; Urrestarazu-Gavilán, Miguel. 2015. DEVELOPMENT OF A NEW CONTROL ALGORITHM FOR AUTOMATIC IRRIGATION SCHEDULING IN SOILLESS CULTURE. Applied Mathematics & Information Sciences. 9: 47-55. (Base de datos de indexación: JCR 2014 N° de citas: 17 Posición en la categoría MATHEMATICS, APPLIED Q3 128/ 247 Índice de impacto: 0.73)

Publicación en Revista. Fernández-Ahumada L.M.,Ramírez-Faz J.,López-Luque R.,Varo-Martínez M.,Moreno-García I.M.,Casares de la Torre F.. 2020. INFLUENCE OF THE DESIGN VARIABLES OF PHOTOVOLTAIC PLANTS WITH TWO-AXIS SOLAR TRACKING ON THE OPTIMIZATION OF THE TRACKING AND BACKTRACKING TRAJECTORY. Solar Energy. 208: 393-404. (Base de datos de indexación: JCR 2020; N° de citas: 12; Posición en la categoría ENERGY & FUELS D1 38114; Índice de impacto: 5.742)

Publicación en Revista. Calero-Lara M.,López-Luque R.,Casares F.J.. 2021. METHODOLOGICAL ADVANCES IN THE DESIGN OF PHOTOVOLTAIC IRRIGATION. Agronomy. 11. (Base de datos de indexación: JCR 2021; N° de citas: 4; Posición en la categoría AGRONOMY 16/91 Índice de impacto: 3.417)

Publicación en Revista. Fernández-De Ahumada, Luis Manuel; Casares-De-La-Torre, Francisco Jose; Ramírez-Faz, José Cristóbal; Lopez-Luque, Rafael. 2017. Mathematical study of the movement of solar tracking systems based on rational models. Solar Energy. 150: 20-29. (Base de datos de indexación: JCR 2017 N° de citas: 23 Posición en la categoría ENERGY & FUELS Q1:21/90 Índice de impacto: 4.02)

Publicación en Revista. Reca-Cardena, Juan; Torrente-Rodríguez, Cristobal Juan; Lopez-Luque, Rafael; Martinez-Lopez, Juan. 2016. Feasibility analysis of a standalone direct pumping photovoltaic system for irrigation in Mediterranean greenhouses. Renewable Energy. 85: 1143-1154. (Base de datos de indexación: JCR 2016 N° de citas: 68 Posición en la categoría ENERGY & FUELS 18/90 Índice de impacto: 4.36)

Publicación en Revista. Lopez-Luque, Rafael; Reca-Cardena, Juan; Martinez-Lopez, Juan. 2015. Optimal design of a standalone direct pumping photovoltaic system for deficit irrigation of olive orchards. Applied Energy. 149: 13-23. (Base de datos de indexación: JCR 2015 N° de citas: 33 Posición en la cat. ENERGY & FUELS Q1: 10/88 Índice de impacto: 5.75)

Publicación en Revista. Ramírez-Faz, José Cristóbal; Lopez-Luque, Rafael; Casares-De-La-Torre, Francisco Jose. 2015. DEVELOPMENT OF SYNTHETIC HEMISPHERIC PROJECTIONS SUITABLE FOR ASSESSING THE SKY VIEW FACTOR ON VERTICAL PLANES. Renewable Energy. 74: 279-286. (Base de datos de indexación: JCR 2015 N° de citas: 6 Posición en la categoría ENERGY & FUELS Q2: 23 / 82 Índice de impacto: 3.36)

C.2. Congress

A NEW METHODOLOGY TO PREVENT SHADOWS IN TWO-AXIS SOLAR TRACKING PLANTS. Fernández-Ahumada, L.M., Ramírez-Faz, J., López-Luque, R., .Moreno-García, I.M., Casares De La Torre, F. Proceedings - 2019 IEEE International Conference on

Environment and Electrical Engineering and 2019 IEEE Industrial and Commercial Power Systems Europe, IEEEIC/I and CPS Europe 2019, 2019, 8783819

AN APPROACH FOR THE SOLAR ENERGY ASSESSMENT USING WEATHER MEDIUM-RANGE FORECASTING. Moreno-Garcia, I.M., López-Luque, R., Varo-Martínez, M., .Ramírez-Faz, J.C., De La Torre, F.C. Proceedings - 2019 IEEE International Conference on Environment and Electrical Engineering and 2019 IEEE Industrial and Commercial Power Systems Europe, IEEEIC/I and CPS Europe 2019, 2019, 8783583

C.3. Research projects

- CLARA - Climate forecast enabled knowledge services. Programa H2020Unión Europea. Financiación 486.875,00 EUR.

(PP GALILEO-2016-MI)TEP-215 FÍSICA PARA LAS ENERGÍAS Y RECURSOS RENOVABLES. 100% UNIVERSIDAD DE CÓRDOBA. Lopez-Luque, Rafael (Universidad de Córdoba). 2016. 1456.93 EUR.

(PP.GALILEO-2015-MI)TEP-215 FÍSICA PARA LAS ENERGIAS Y RECURSOS RENOVABLES. 100% UNIVERSIDAD DE CÓRDOBA. Lopez-Luque, Rafael (Universidad de Córdoba). 2015. 2105.26 EUR.

C.4. Contracts, technological or transfer merits

- Estudio experimental de hipótesis termodinámicas encaminadas a la depuración de agua.. Lopez-Luque, Rafael (Universidad de Córdoba). 2016-2016. 968.00 EUR.

- Estudio de posibles mejoras técnicas aplicables a un prototipo de concentrador Fresnel. Lopez-Luque, Rafael (Universidad de Córdoba). 2013-2013. 605.00 EUR.

Desarrollo de un modelo matemático de simulación del comportamiento térmico de un absorbedor plano. Lopez-Luque, Rafael (Universidad de Córdoba). 2012-2012. 7906.00 EUR.

REHABILITACIÓN ENERGÉTICA DE EDIFICIOS DOCENTES EN ANDALUCÍA. REDUCA. Acciona Infraestructuras 2010-2012. 36000Euros

Participation in 2 special agrivoltaic programs in the "En Red" program (Canal Sur). I have also participated in the Researchers' Night, a scientific dissemination program promoted by the European Commission. Likewise, I have participated in numerous interviews and talks on dissemination.