

Memoria Grupo AHEP 2022

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Publicaciones en revistas indexadas Web of Science en 2022

Publicaciones en física teórica

1. *PArthENoPE revolutions*
S. Gariazzo, P.F. de Salas, O. Pisanti y R. Consiglio
Computer Physics Communications **271** (2022) 108205 [arXiv:2103.05027]
DOI: 10.1016/j.cpc.2021.108205
2. *Probing the minimal $U(1)_X$ model at future electron-positron colliders via fermion pair-production channels*
A. Das, P.S. Bhupal Dev, Y. Hosotani y **S. Mandal**
Physical Review D **105** (2022) 115030 [arXiv:2104.10902]
DOI: 10.1103/PhysRevD.105.115030
3. *Dark matter in a charged variant of the Scotogenic model*
M. Puerta, **V. De Romeri** y **A. Vicente**
European Physical Journal C **82** (2022) 623 [arXiv:2106.00481]
DOI: 10.1140/epjc/s10052-022-10532-5
4. *ALP-portal majorana dark matter*
S. Gola, **S. Mandal** y N. Sinha
International Journal of Modern Physics A **37** (2022) 2250131 [arXiv:2106.00547]
DOI: 10.1142/S0217751X22501317
5. *Gravitational wave induced baryon acoustic oscillations*
C. Döring, **S. Centelles Chuliá**, M. Lindner, B.M. Schaefer y M. Bartelmann
SciPost Physics **12** (2022) 114 [arXiv:2107.10283]
DOI: 10.21468/SciPostPhys.12.3.114
6. *Observable flavor violation from spontaneous lepton number breaking*
P. Escribano, **M. Hirsch**, **J. Nava** y **A. Vicente**
Journal of High Energy Physics **01** (2022) 098 [arXiv:2108.01101]
DOI: 10.1007/JHEP01(2022)098
7. *Impact of COHERENT measurements, cross section uncertainties and new interactions on the neutrino floor*
D. Aristizábal Sierra, **V. De Romeri**, L.J. Flores y D.K. Papoulias
Journal of Cosmology and Astroparticle Physics **01** (2022) 055 [arXiv:2109.03247]
DOI: 10.1088/1475-7516/2022/01/055
8. *Scotogenic neutrino masses with gauged matter parity and gauge coupling unification*
A.E. Cárcamo Hernández, C. Hati, S. Kovalenko, **J.W.F. Valle** y C.A. Vaquera-Araujo

Journal of High Energy Physics **03** (2022) 034 [arXiv:2109.05029]
DOI: 10.1007/JHEP03(2022)034

9. *Temperature effects on the Z_2 symmetry breaking in the scotogenic model*
A. Alvarez, **R. Cepedello**, **M. Hirsch** y W. Porod
Physical Review D **105** (2022) 035013 [arXiv:2110.04311]
DOI: 10.1103/PhysRevD.105.035013
10. *Scotogenic Majorana neutrino masses in a predictive orbifold theory of flavor*
F.J. de Anda, **O. Medina**, **J.W.F. Valle** y C.A. Vaquera-Araujo
Physical Review D **105** (2022) 055030 [arXiv:2110.06810]
DOI: 10.1103/PhysRevD.105.055030
11. *Long-lived heavy neutral leptons at the LHC: four-fermion single- N_R operators*
R. Beltrán, G. Cottin, J.C. Helo, **M. Hirsch**, A. Titov y Z.S. Wang
Journal of High Energy Physics **01** (2022) 044 [arXiv:2110.15096]
DOI: 10.1007/JHEP01(2022)044
12. *Nonstandard interactions from the future neutrino solar sector*
P. Martínez-Miravé, **S. Molina Sedgwick** y **M. Tórtola**
Physical Review D **105** (2022) 035004 [arXiv:2111.03031]
DOI: 10.1103/PhysRevD.105.035004
13. *Nonunitarity of the lepton mixing matrix at the European Spallation Source*
S.S. Sachi Chatterjee, O.G. Miranda, **M. Tórtola** y **J.W.F. Valle**
Physical Review D **106** (2022) 075016 [arXiv:2111.08673]
DOI: 10.1103/PhysRevD.106.075016
14. *Simplified models for resonant neutral scalar production with missing transverse energy final states*
H. Bahl, **V. Martín Lozano** y G. Weiglein
Journal of High Energy Physics **11** (2022) 042 [arXiv:2112.12656]
DOI: 10.1007/JHEP11(2022)042
15. *Interpreting B anomalies within an extended 331 gauge theory*
A. Addazi, G. Ricciardi, S. Scarlatella, R. Srivastava y **J.W.F. Valle**
Physical Review D **106** (2022) 035030 [arXiv:2201.12595]
DOI: 10.1103/PhysRevD.106.035030
16. *High-energy colliders as a probe of neutrino properties*
S. Mandal, O.G. Miranda, G. Sánchez García, **J.W.F. Valle** y Xun-Jie Xu
Physics Letters B **829** (2022) 137110 [arXiv:2202.04502]
DOI: 10.1016/j.physletb.2022.137110
17. *Consequences of the Dresden-II reactor data for the weak mixing angle and new physics*
D. Aristizábal Sierra, **V. De Romeri** y D.K. Papoulias
Journal of High Energy Physics **09** (2022) 076 [arXiv:2203.02414]
DOI: 10.1007/JHEP09(2022)076

18. *Toward deconstructing the simplest seesaw mechanism*
S. Mandal, O.G. Miranda, G. Sánchez García, **J.W.F. Valle** y X.J. Xu
Physical Review D **105** (2022) 095020 [arXiv:2203.06362]
DOI: 10.1103/PhysRevD.105.095020
19. *Absolute neutrino mass scale and dark matter stability from flavour symmetry*
S. Centelles Chuliá, R. Cepedello y **O. Medina**
Journal of High Energy Physics **10** (2022) 080 [arXiv:2204.12517]
DOI: 10.1007/JHEP10(2022)080
20. *Neutrino mass and mass ordering: no conclusive evidence for normal ordering*
S. Gariazzo, M. Gerbino, T. Brinckmann, M. Lattanzi, O. Mena, T. Schwetz, S.R. Choudhury, K. Freese, S. Hannestad, C.A. Ternes y **M. Tórtola**
Journal of Cosmology and Astroparticle Physics **10** (2022) 010 [arXiv:2205.02195]
DOI: 10.1088/1475-7516/2022/10/010
21. *A method for approximating optimal statistical significances with machine-learned likelihoods*
E. Arganda, X. Marcano, **V. Martín Lozano**, A.D. Medina, A.D. Pérez, M. Szwec y A. Szykman
European Physical Journal C **82** (2022) 993 [arXiv:2205.05952]
DOI: 10.1140/epjc/s10052-022-10944-3
22. *Cosmology-friendly time-varying neutrino masses via the sterile neutrino portal*
G.Y. Huang, M. Lindner, **P. Martínez-Miravé** y M. Sen
Physical Review D **106** (2022) 033004 [arXiv:2205.08431]
DOI: 10.1103/PhysRevD.106.033004
23. *How many 1-loop neutrino mass models are there?*
C. Arbeláez, R. Cepedello, J.C. Helo, **M. Hirsch** y S. Kovalenko
Journal of High Energy Physics **08** (2022) 023 [arXiv:2205.13063]
DOI: 10.1007/JHEP08(2022)023
24. *Solar electron antineutrino flux: Revisiting bounds on neutrino magnetic moments and solar magnetic field*
E. Akhmedov y **P. Martínez-Miravé**
Journal of High Energy Physics **10** (2022) 144 [arXiv:2207.04516]
DOI: 10.1007/JHEP10(2022)144
25. *Scale-invariant 3-3-1-1 model with B-L symmetry*
A.G. Dias, **J. Leite** y B.L. Sánchez-Vega
Physical Review D **106** (2022) 115008 [arXiv:2207.06276]
DOI: 10.1103/PhysRevD.106.115008
26. *Mapping the SMEFT to discoverable models*
R. Cepedello, F. Esser, **M. Hirsch** y V. Sanz
Journal of High Energy Physics **09** (2022) 229 [arXiv:2207.13714]
DOI: 10.1007/JHEP09(2022)229

27. *Physics implications of recent Dresden-II reactor data*
A. Majumdar, D.K. Papoulias, R. Srivastava y **J.W.F. Valle**
Physical Review D **106** (2022) 093010 [arXiv:2208.13262]
DOI: 10.1103/PhysRevD.106.093010
28. *Collider searches for heavy neutral leptons: beyond simplified scenarios*
A. Abada, **P. Escribano**, X. Marcano y G. Piazza
European Physical Journal C **82** (2022) 1030 [arXiv:2208.13882]
DOI: 10.1140/epjc/s10052-022-11011-7
29. *W-mass anomaly in the simplest linear seesaw mechanism*
A. Batra, P. Bharadwaj, S. Mandal, R. Srivastava y **J.W.F. Valle**
Physics Letters B **834** (2022) 137408 [arXiv:2208.04983]
DOI: 10.1016/j.physletb.2022.137408

Publicaciones en el marco de grandes colaboraciones internacionales

1. *Quantum gravity phenomenology at the dawn of the multi-messenger era – A review*
A. Addazi et al [incluye a **P. Martínez-Miravé** y **M. Tórtola**]
Progress in Particle and Nuclear Physics **125** (2022) 103948 [arXiv:2111.05659]
DOI: 10.1016/j.pnpnp.2022.103948
2. *Design, construction and operation of the ProtoDUNE-SP Liquid Argon TPC*
DUNE collaboration, A. Abed Abud et al [incluye a **V. De Romeri**, **M. Masud**, **C.A. Ternes**, **M. Tórtola** y **J.W.F. Valle**]
Journal of Instrumentation **17** (2022) P01005 [arXiv:2108.01902]
DOI: 10.1088/1748-0221/17/01/P01005
3. *Low exposure long-baseline neutrino oscillation sensitivity of the DUNE experiment*
DUNE collaboration, A. Abed Abud et al [incluye a **V. De Romeri**, **P. Martínez-Miravé**, **C.A. Ternes**, **M. Tórtola** y **J.W.F. Valle**]
Physical Review D **105** (2022) 072006 [arXiv:2109.01304]
DOI: 10.1103/PhysRevD.105.072006
4. *Scintillation light detection in the 6-m drift-length ProtoDUNE Dual Phase liquid argon TPC*
DUNE collaboration, A. Abed Abud et al [incluye a **V. De Romeri**, **P. Martínez-Miravé**, **C.A. Ternes**, **M. Tórtola** y **J.W.F. Valle**]
European Physical Journal C **82** (2022) 618 [arXiv:2203.16134]
DOI: 10.1140/epjc/s10052-022-10549-w
5. *Separation of track- and shower-like energy deposits in ProtoDUNE-SP using a convolutional neural network*
DUNE collaboration, A. Abed Abud et al [incluye a **V. De Romeri**, **P. Martínez-Miravé**, **C.A. Ternes**, **M. Tórtola** y **J.W.F. Valle**]
European Physical Journal C **82** (2022) 903 [arXiv:2203.17053]
DOI: 10.1140/epjc/s10052-022-10791-2

Ponencias y comunicaciones a congresos

1. *Neutrino theory*
J.W.F. Valle
30th International Symposium on Lepton Photon Interactions at High Energies
conferencia virtual, 10-14 enero
2. *Dark matter as the origin of neutrino mass in the inverse seesaw mechanism*
S. Mandal
30th International Symposium on Lepton Photon Interactions at High Energies
conferencia virtual, 10-14 enero
3. *Heavy neutral leptons and EFT*
M. Hirsch
International Meeting on Effective Pathways to New Physics (IMEPNP)
conferencia virtual, 7-12 febrero
4. *Neutrino decoherence at reactors*
V. De Romeri
56th Rencontres de Moriond: Electroweak Interactions & Unified Theories
La Thuile (Italia), 12-19 marzo
5. *Cosmological radiation density with non-standard neutrino-electron interactions*
S. Pastor
XIII Jornadas del CPAN
Huelva, 21-23 marzo
6. *An ultraviolet completion for the Scotogenic model*
P. Escribano
XIII Jornadas del CPAN
Huelva, 21-23 marzo
7. *Writing skills for science outreach*
A. Vicente
@FlipPhysics workshop
IFIC Valencia, 21-25 marzo
8. *Signatures of primordial black hole dark matter at DUNE and THEIA*
P. Martínez-Miravé
@FlipPhysics workshop
IFIC Valencia, 21-25 marzo
9. *Flavour symmetry and neutrino masses*
O. Medina
@FlipPhysics workshop
IFIC Valencia, 21-25 marzo
10. *Impact of COHERENT, cross section uncertainties and new interactions on the neutrino floor*
V. De Romeri
7th Symposium on Neutrinos and Dark Matter in Nuclear Physics (NDM 22)
Asheville (Estados Unidos), 16-21 mayo

11. *Neutrino non-standard interactions from the future solar sector*
P. Martínez-Miravé
19th MultiDark Consolider Workshop
Miraflores de la Sierra (Madrid), 23-25 mayo
12. *An ultraviolet completion for the Scotogenic model*
P. Escribano
19th MultiDark Consolider Workshop
Miraflores de la Sierra (Madrid), 23-25 mayo
13. *Simplified models for resonant neutral scalar production with missing transverse energy final states*
V. Martín Lozano
19th MultiDark Consolider Workshop
Miraflores de la Sierra (Madrid), 23-25 mayo
14. *A solar electron antineutrino flux: bounds on neutrino magnetic moments and the solar magnetic field revisited (póster)*
P. Martínez-Miravé
XXX International Conference on Neutrino Physics and Astrophysics (NEUTRINO 2022)
conferencia remota, 30 mayo – 4 junio
15. *Neutrino physics overview*
M. Tórtola
Double Beta Decay: the road to normal hierarchy sensitivity
Lisboa (Portugal), 6-7 junio
16. *Neutrino mass models*
J.W.F. Valle
Double Beta Decay: the road to normal hierarchy sensitivity
Lisboa (Portugal), 6-7 junio
17. *Higgs lepton flavor violating decays*
A. Vicente
Dual CP Institute of High Energy Physics Workshop 2022
Comala (México), 6-14 junio
18. *Neutrino properties from oscillation data*
P. Martínez-Miravé
Jornadas Científicas del IFIC: Line 2, Neutrinos and lepton flavour
IFIC Valencia, 16-17 junio
19. *Neutrino mass models*
M. Hirsch
Jornadas Científicas del IFIC: Line 2, Neutrinos and lepton flavour
IFIC Valencia, 16-17 junio
20. *Overview of the three-neutrino oscillation picture*
M. Tórtola

- 9th Flavour Symmetries and Consequences in Accelerators and Cosmology workshop (FLASY2022)
Lisboa (Portugal), 27 junio - 1 julio
21. *Completing the Standard Model*
J.W.F. Valle
9th Flavour Symmetries and Consequences in Accelerators and Cosmology workshop (FLASY2022)
Lisboa (Portugal), 27 junio - 1 julio
 22. *Coherent elastic neutrino-nucleus scattering in the Standard Model and beyond*
V. De Romeri
9th Flavour Symmetries and Consequences in Accelerators and Cosmology workshop (FLASY2022)
Lisboa (Portugal), 27 junio - 1 julio
 23. *Heavy neutral leptons as long-lived particles*
M. Hirsch
9th Flavour Symmetries and Consequences in Accelerators and Cosmology workshop (FLASY2022)
Lisboa (Portugal), 27 junio - 1 julio
 24. *Long-lived particles and meson decays in N_R LEFT*
R. Beltrán
9th Flavour Symmetries and Consequences in Accelerators and Cosmology workshop (FLASY2022)
Lisboa (Portugal), 27 junio - 1 julio
 25. *Cosmology-friendly time-varying neutrino masses in beta decay experiments*
P. Martínez-Miravé
9th Flavour Symmetries and Consequences in Accelerators and Cosmology workshop (FLASY2022)
Lisboa (Portugal), 27 junio - 1 julio
 26. *An ultraviolet completion for the Scotogenic model*
P. Escribano
9th Flavour Symmetries and Consequences in Accelerators and Cosmology workshop (FLASY2022)
Lisboa (Portugal), 27 junio - 1 julio
 27. *Scotogenic Majorana neutrino masses in an orbifold theory of flavor*
O. Medina
9th Flavour Symmetries and Consequences in Accelerators and Cosmology workshop (FLASY2022)
Lisboa (Portugal), 27 junio - 1 julio
 28. *Cosmological radiation density with non-standard neutrino physics*
S. Pastor
41st International Conference on High Energy Physics (ICHEP 2022)
Bologna (Italia), 6-13 julio
 29. *An initiative to invert gender statistics at nuclear and particle physics workshops: @FlipPhysics*
M. Tórtola
XXXVIII Reunión Biental de la Real Sociedad Española de Física
Murcia, 11-15 julio
 30. *Phenomenology of time-varying neutrino masses*
P. Martínez-Miravé

3rd Annual Conference COST CA18108
Nápoles (Italia), 12-15 julio

31. *Signatures of primordial black hole dark matter at DUNE and THEIA*
V. De Romeri
TeV Particle Astrophysics (TeVPA 2022)
Kingston (Canadá), 8-12 agosto
32. *Scotogenic models: Neutrinos, dark matter and more*
A. Vicente
Neutrino Oscillation Workshop (NOW 2022)
Ostuni (Italia), 4-11 septiembre
33. *Neutrino Physics*
M. Tórtola
XLIX International Meeting on Fundamental Physics
Benasque (Huesca), 6-9 septiembre
34. *DsixTools*
A. Vicente
2nd Workshop on Tools for Low-Energy SMEFT Phenomenology (SMEFT-Tools 2022)
Zurich (Suiza), 14-16 septiembre
35. *Coherent elastic neutrino-nucleus scattering in the Standard Model and beyond*
V. De Romeri
International Conference on Neutrinos and Dark Matter (NuDM-2022)
Sharm El-Sheikh (Egipto), 24-28 septiembre
36. *Coherent elastic neutrino-nucleus scattering in the Standard Model and beyond*
V. De Romeri
Beyond the Standard Models: Particle Physics meets Cosmology
IFT Madrid, 3-28 octubre
37. *Multi-charged long-lived particles*
M. Hirsch
CMS group meeting, Fermilab
conferencia virtual, 26 octubre
38. *Long-lived heavy neutral leptons from meson decays in EFT*
R. Beltrán
Searching for long-lived particles at the LHC and beyond: 12th workshop of the LLP Community
conferencia virtual, 31 octubre - 4 noviembre
39. *Long-baseline oscillation physics and non-standard scenarios*
M. Tórtola
DUNE Module of Opportunity Workshop
Valencia, 2-4 noviembre
40. *Neutrino mass hierarchy from the discrete dark matter model*
O. Medina

8th Symposium on Prospects in the Physics of Discrete Symmetries (DISCRETE 2022)
Baden-Baden (Alemania), 7-11 noviembre

41. *Neutrino masses, flavor anomalies and muon $g-2$ from dark loops*
P. Escribano
8th Symposium on Prospects in the Physics of Discrete Symmetries (DISCRETE 2022)
Baden-Baden (Alemania), 7-11 noviembre
42. *Relic neutrino decoupling in some non-standard scenarios*
S. Pastor
Current Topics in Astroparticle Physics
Munich (Alemania), 9-11 noviembre
43. *Long-lived heavy neutral leptons and EFTs at the LHC*
R. Beltrán
XIV Jornadas del CPAN
Bilbao, 23-25 noviembre
44. *An ultraviolet completion for the Scotogenic model*
P. Escribano
7th IBS-Multidark-ICTP Workshop
Daejeon (Corea), 28 noviembre - 2 diciembre
45. *Z'-explorer 2.0: In the quest of Dark Matter*
V. Martín Lozano
7th IBS-Multidark-ICTP Workshop
Daejeon (Corea), 28 noviembre - 2 diciembre
46. *Physics potential of CEvNS in the Standard Model and beyond*
V. De Romeri
16th International Workshop on the Dark Side of the Universe (DSU 2022)
Sydney (Australia), 5-9 diciembre

Tesis de máster

1. *Coherent elastic neutrino-nucleus scattering: a COHERENT CsI analysis within the Standard Model*
Pablo Muñoz Candela
Máster en Física Avanzada, Universidad de Valencia
Dirigida por Valentina De Romeri
Fecha lectura: 21 julio
2. *Electro-weak scale right-handed neutrinos and LHC*
Meritxell García Suñer
Máster en Física Avanzada, Universidad de Valencia
Dirigida por Martin Hirsch
Fecha lectura: 16 septiembre

3. *Inverse seesaw mechanism with spontaneous lepton number violation*
Antonio Herrero Brocal
Máster en Física Avanzada, Universidad de Valencia
Dirigida por Avelino Vicente
Fecha lectura: 20 septiembre

Cursos impartidos

1. *The theory and phenomenology of neutrinos (3 horas)*
M. Tórtola
Graz Graduate Days on Neutrino Physics
Graz (Austria), 2-3 junio
2. *Computing tools for the SMEFT (4,5 horas)*
A. Vicente
SMEFT 2022 Physics School: Theory and Phenomenology of the Standard Model EFT
Siegen (Alemania), 11-15 julio

Coloquios y seminarios impartidos

- *What is next in particle physics?*
J.W.F. Valle
Instituto de Física, Univ. Nacional Autónoma de México, seminario remoto, 10 junio
- *Solar neutrinos: Shining light on neutrino properties*
P. Martínez-Miravé
Instituto Superior Técnico, Lisboa (Portugal), 21 septiembre
- *Neutrinos and the landscape of new physics*
J.W.F. Valle
Millennium Institute for SubAtomic Physics at the High-energy Frontier (Chile),
seminario remoto, 7 octubre
- *Terrestrial and cosmological probes of non-standard neutrino interactions*
P. Martínez-Miravé
Niels Bohr Institute, Copenhagen (Dinamarca), 7 noviembre
- *A solar antineutrino flux from neutrino magnetic moments*
P. Martínez-Miravé
Technische Universität München, Munich (Alemania), 21 noviembre
- *El neutrino, la misteriosa partícula fantasma*
S. Pastor
Universidad del País Vasco, 22 noviembre
- *Heavy neutral leptons and long-lived particle searches*
M. Hirsch
Universidad de Granada, 23 noviembre