

# Neutrinos as a Probe of Dark-Matter Particles

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We try to envision that there might be a dark-matter world and neutrinos, especially the right-handed ones, might be coupled directly with particles in the dark-matter world. This means that the minimal Standard Model [1], which describes the ordinary-matter world to begin with, should be extended in some way. Our candidate theory would be the extended Standard Model based on  $SU_c(3) \times SU_L(2) \times U(1) \times SU_f(3) \times SU_R(2)$  [2, 3], with the search of the detailed version suggested to be simplified via the two working rules, “Dirac similarity principle” and “minimum Higgs hypothesis” [4].

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## References:

- [1] Ta-You Wu and W-Y. Pauchy Hwang, “Relativistic Quantum Mechanics and Quantum Fields” (World Scientific 1991); Francis Halzen and Alan D. Martin, “Quarks and Leptons” (John Wiley and Sons, Inc. 1984); E.D. Commins and P.H. Bucksbaum, “Weak Interactions of Leptons and Quarks” (Cambridge University Press 1983). This was “my” early list of the textbooks on the “Standard Model”.
- [2] W-Y. Pauchy Hwang, Nucl. Phys. A844, 40c (2010); W-Y. Pauchy Hwang, International J. Mod. Phys. A24, 3366 (2009); the idea first appeared in hep-ph, arXiv: 0808.2091; talk presented at 2008 CosPA Symposium (Pohang, Korea, October 2008), Intern. J. Mod. Phys. Conf. Series 1, 5 (2011); plenary talk at the 3rd International Meeting on Frontiers of Physics, 12-16 January 2009, Kuala Lumpur, Malaysia, published in American Institute of Physics 978-0-7354-0687-2/09, pp. 25-30 (2009).
- [3] J.C. Pati and A. Salam, Phys. Rev. D10, 275 (1974); R.N. Mohapatra and J.C. Pati, Phys. Rev. D11, 566 (1975); D11, 2559 (1975).
- [4] W-Y. P. Hwang, arXiv:11070156v1 (hep-ph, 1 Jul 2011), Plenary talk given at the 10th International Conference on Low Energy Antiproton Physics (Vancouver, Canada, April 27 - May 1, 2011), to be published.

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