ABOUT MIRROR SYMMETRY OF β-DECAY

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We critically examine the conclusion that the observed mirror asymmetry of β-decay is a proof that nature is invariant under space inversion. By taking into account a distinction between external, internal and total space inversion, it is obvious that the inversion which is conventionally applied to the β-decay process is not the total space inversion but only the partial one[1]. The fields that we use conventionally to represent particles involved in β-decay, do not describe the internal structure of the particles. To apply space inversion to these fields means to apply only the external space inversion to corresponding particles. Nothing is said about the transformation of the internal structures of the particles. Hence, the parity which is conserved is not the total parity, but only the external parity. Non-conseravtion of the external parity does not automatically mean non-invariance of nature under space inversion, but only non-invariance under external space inversion. It is still possible that nature is invariant under total space inversion, if we assume the existence of mirror particles, with reflected internal structures. All their properties like mass, charge spin, etc., are the same as for ordinary particles, only their screw – sense behaviour is different in processes with weak interaction. The possibility of mirror particles has been previously recognized[2], but not related explicitly to the transformation of internal structure.

REFERENCES

1) M. Pavšič, *Int. J. Theor. Phys.* **9**, No.4, 229-244 (1974).

2) J. J. Sakurai, *"Invariance Principles and Elementary Particles"*,
    p. 151, Princeton University Press, Prinecton, New Jersey, 1964.