RENORMDYNAMICS OF COUPLING CONSTANTS AND MASSES

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In the Standard Model of Particle Physics (*SM*), the values of the coupling constants and masses of particles depend on the scale according to the Renormdynamic motion equations. For the electron and nucleon masses, electrodynamic and pion-nucleon fine structure constants we have an empirical relation: $\frac{m_e}{\alpha} \approx \frac{m_N}{\alpha_{\pi N}}$. We take the relation $\frac{m}{\alpha} = const$ as an integral of renormdynamic motion equations for m and α find an exact form of the β function in the minimal mass parametrization and find exact solution of the corresponding renormdynamic motion equations. In a fundamental theory the values of the fundamental physical constants will also be defined from the solutions of the corresponding renormdynamic motion equations. In *SM*, for minimal super symmetric extension of the *SM*, standard pion-nucleon field theory and other models it is shown how to define the values of coupling constants and masses [1],[2].

References

1. Makhaldiani N., Renormdynamics, Discrete Dynamics and Spin, Journal of Physics: Conference Series 678 (2016) 012029
2. Makhaldiani N, Renormdynamics and Hadronization, Journal of Physics: Conference Series 668 (2016) 012114