

In this chapter the implications of the updated vision of standard model physics and hadron physics are considered. The goal is to develop a phenomenological picture of hadrons based on the general mathematical framework of TGD and on the interpretation of strong and weak interactions as different aspects of color interaction.

The additivity of the mass squared values identified as conformal weights at the level of the embedding space H is a crucial assumption made also in the p-adic mass calculations. One must check whether this assumption is physically sensible and how it relates to the additivity of masses assumed in the constituent quark model and understand the relation between the notions of current quark mass and constituent quark mass. One should also identify various contributions to the hadron mass squared in the new picture and understand the hadronic mass splittings.

The results of the simple calculations deducing the p-adic mass scales of hadrons and quarks mean a breakthrough in the quantitative understanding of the hadronic mass spectrum. In particular, the identification of color interactions in fermionic isospin degrees of freedom as weak interactions with a p-adically scaled up range explains the mass splittings due to isospin. The smallness of the Weinberg angle for scaled up weak interactions can explain how the interactions become strong and why the parity violation for strong interactions is small. A formula for Weinberg angle is deduced in terms of fermion masses.