Point form relativistic Hamiltonian dynamics and pion charge radius

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The analytic expressions for the mean square radius of a π-meson are obtained by means of various model wave functions within the Poincare covariant quark model based on of the point form relativistic Hamiltonian dynamics.

The paper shows that the correspondence between experimental and theoretical values of a π-meson can be achieved by introducing a quark form-factor. Moreover, the momentum given to the quark is not equal to the one given to the π-meson.

The values of the mean square radius of a quark for various model wave functions are obtained by means of the dipole dependence of the quark form-factor on the transferred momentum.