About classification of the general functional equations, having three subject variables, on the set of invertible two-placed functions

A two-placed function $f$, defined on an arbitrary set $Q$, is said to be invertible or quasigroup, if every of the equations $f(x; a) = b$, $f(a; y) = b$ has a unique solution for all $a, b$ of $Q$. Assigning $x$ and $y$ to every pair $(a; b)$ defines invertible functions $f^L$ and $f^R$ on $Q$. So, the superidentities

$$F(F^L(x; y); y) = x, \quad F(x; F^R(x; y)) = y, \quad (F^L)^r = F, \quad (F^R)^r = F$$  \hspace{1cm} (1)$$

hold, i.e. the equalities are true for all $F \in \Delta$ and $x, y \in Q$, where $\Delta$ denotes the set of all invertible functions of the set $Q$.

Functional equations, having no functional and subject constants and having two-placed functional variable only, are under consideration. A functional equation is called general, if all functional variables are pairwise different. Two functional equations are said to be parastrophic equivalent (see [1]), if one can be obtained from the other in a finite number of renaming functional or subject variables or applying the superidentities (1).

If a functional equation has one occurrence of a subject variable and has a solution on $\Delta$, then $|Q| = 1$. A subject variable having exactly two occurrences in a functional equation is said to be quadratic. A functional equations is called quadratic, if every its subject variable is quadratic. The functional equations of associativity, bisymmetry, transitivity are quadratic (see [2]). The distributivity and Moufang functional equations have two quadratic variables, and the third variable has tree and four occurrences respectively.

**Theorem.** Every general functional equation, having two quadratic variables and one three (four) occurrence variable, is parastrophic equivalent to at least one of five (respectively, eight) functional equations.

Eleven of these thirteen functional equations have been solved (see [3]).

