Title: On Stetkær type functional equations and Hyers–Ulam stability

Author(s): Bouikhalene Belaid and Elqorachi Elhoucien

Let G be a locally compact group, K a compact subgroup of morphisms of G, $\chi : K \longrightarrow \{z \in \mathbb{C} \mid |z| = 1\}$ a continuous homomorphism and μ a K-invariant bounded measure on G. In this paper we study functional equations of the form

$$\int_G \int_K f(xtk \cdot y)\overline{\chi}(k)dkd\mu(t) = g(x)h(y), \quad x, y \in G,$$

in which $f, g, h \in C_b(G)$ are unknown functions. These equations may be viewed as a generalization of the functional equations considered by Stetkær in many of his works. We show how the solutions g and h are closely related to the solutions of Badora's functional equation solved in [4] and [13]. We treat examples and we give some applications. The case where G is a Lie group is considered. Furthermore, we investigate the Hyers–Ulam stability problem of these functional equations.

Address:
Bouikhalene Belaid
Department of Mathematics
University of Ibn Tofail
Faculty of Sciences
BP 133, Kenitra 14000
Morocco
E-mail: bbouikhalene@yahoo.fr

Address:
Elqorachi Elhoucien
Department of Mathematics
University of Ibn Zohr
Faculty of Sciences
Agadir
Morocco
E-mail: elqorachi@hotmail.com