

## WEAK-2-LOCAL ISOMETRIES ON UNIFORM ALGEBRAS AND LIPSCHITZ ALGEBRAS

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**Abstract:** We establish spherical variants of the Gleason–Kahane–Żelazko and Kowalski–Słodkowski theorems, and we apply them to prove that every weak-2-local isometry between two uniform algebras is a linear map. Among the consequences, we solve a couple of problems posed by O. Hatori, T. Miura, H. Oka, and H. Takagi in 2007.

Another application is given in the setting of weak-2-local isometries between Lipschitz algebras by showing that given two metric spaces  $E$  and  $F$  such that the set  $\text{Iso}((\text{Lip}(E), \|\cdot\|), (\text{Lip}(F), \|\cdot\|))$  is canonical, then every weak-2-local  $\text{Iso}((\text{Lip}(E), \|\cdot\|), (\text{Lip}(F), \|\cdot\|))$ -map  $\Delta$  from  $\text{Lip}(E)$  to  $\text{Lip}(F)$  is a linear map, where  $\|\cdot\|$  can indistinctly stand for  $\|f\|_L := \max\{L(f), \|f\|_\infty\}$  or  $\|f\|_s := L(f) + \|f\|_\infty$ .

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**Key words:** 2-local isometries, uniform algebras, Lipschitz functions, spherical Gleason–Kahane–Żelazko theorem, spherical Kowalski–Słodkowski theorem, weak-2-local isometries.