

# TOEPLITZ OPERATORS WITH SYMMETRIC SEPARATELY RADIAL SYMBOLS ON THE UNIT BALL

ARMANDO SÁNCHEZ NUNGARAY, THIS IS A JOINT WORK WITH JOSÉ ROSALES ORTEGA  
AND CARLOS GONZÁLEZ

The principal goal of this work is to explore the relationship between the representation theory, as it is established by Raúl Quiroga, and the commutativity of the  $C^*$ -algebra generated for the Toeplitz operators with symbols invariant under the groups  $\mathbb{T}^n \rtimes S_n$  and  $\mathbb{T}^n \rtimes A_n$ , where  $\mathbb{T}^n$  stand for the  $n$ -dimensional torus,  $S_n$  stand for the symmetric group of permutations of the set  $\{1, 2, \dots, n\}$ , and  $A_n$  is the alternating group of  $S_n$ . It is important to point out that the types of symbols obtained by introducing these new subgroups of  $U(n)$ , the unitary group, generate new commutative algebras which have not been analyzed in current works on Toeplitz operators.

For the case of the symmetric separately radial symbols that correspond to the subgroup  $\mathbb{T}^n \rtimes S_n$  of the biholomorphism group of the unit ball  $\mathbb{B}^n$  on  $\mathbb{C}^n$  we define an unitary operator  $R$  that permit to exhibit the simultaneous diagonalization of the Toeplitz operators with symmetric separately radial symbols into multiplication operators on  $l^2(\mathbb{Z}_+^n)$ . The representation theoretic approach rely on the Shur's lemma and it allows us to prove that the Toeplitz operators with symmetric separately radial symbols satisfies orthogonality relations. Also, the functions for the multiplication operators unitarily equivalent to Toeplitz operators with symmetric separately radial symbols are proved to be constant on the multi-indices that belong at the same  $\mathcal{I}_i$ .

A corresponding study is performed for alternating separately radial symbols, for which the subgroup is  $\mathbb{T}^n \rtimes A_n$  with its linear action on  $\mathcal{B}^n$ .