



**University
of Victoria**

Graduate Studies

Notice of the Final Oral Examination
for the Degree of Master of Science

of

LINA SIMBAQUEBA MARIN

BSc (Universidad Nacional de Colombia, 2023)

“Quasirandom forcing in Regular Tournaments”

Department of Mathematics and Statistics

Friday, April 11, 2025

10:00 A.M.

Clearihue Building

Room B021

Supervisory Committee:

Dr. Jonathan Noel, Department of Mathematics and Statistics, University of Victoria (Supervisor)

Dr. Jane Butterfield, Department of Mathematics and Statistics, UVic (Co-Supervisor)

External Examiner:

Dr. Leonardo Coregiano, Department of Mathematics, University of Chicago

Chair of Oral Examination:

Dr. Clifford Roberts, Department of Philosophy, UVic

Dr. Robin G. Hicks, Dean, Faculty of Graduate Studies

Abstract

The study of quasirandom forcing in various discrete structures has been a well-known problem in Extremal Combinatorics since 1987. In this work, we study quasirandom forcing in the case of tournaments. A tournament H forces quasirandomness if it has the property that every sequence $(T_n)_{n \in \mathbb{N}}$ of tournaments of increasing order is quasirandom if and only if the density of H in T_n asymptotically equals its expected value as $n \rightarrow \infty$. In contrast to the analogous problem in graphs, it was shown that there exists only one non-transitive tournament that forces quasirandomness. To obtain a richer family of tournaments with this property, we propose a variant of it restricting the definition of quasirandom forcing to only nearly regular sequences of tournaments $(T_n)_{n \in \mathbb{N}}$. We characterize all tournaments on at most 5 vertices that forces quasirandomness under this new setting, obtaining that 11 out of 16 tournaments on at least four vertices are quasirandom forcing.