Powerful and Weakly Uniform Ray Pattern Matrices

Jongsam Jeon
Mathematics, Washington State University
jeon@math.wsu.edu

Abstract

In this presentation, we are going to consider combinatorial properties of ray pattern matrices (briefly, ray patterns). A ray pattern A is called powerful if A^n is well-defined for any positive integer n, and is called weakly uniform if it is ray diagonally similar to $\alpha|A|$ for some ray α. First, we will see that for an irreducible ray pattern A, A is powerful iff A is weakly uniform. However, in general case, the result does not hold. There exists a reducible ray pattern A which is not weakly uniform, but is powerful. From this observation, we may think about two problems on ray patterns; when a reducible ray pattern is powerful, and when a reducible ray pattern is weakly uniform. The first question is still open in general, but we will see two characterizations for the second question.