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Dynamical Mechanism of Scaling Behaviors in Multifractal Structure KYUNGSIK KIM, Department of Physics, Pukyong National University, Busan 608-737, Korea, JAE WON JUNG, National Institute of Meteorological Research, KMA, Seoul 156-720, Korea, SOO YONG KIM, Department of Physics, KAIST, Daejeon 305-701, Korea — The pattern of stone distribution in the game of Go (Baduk, Weiqi, or Igo) can be treated in the mathematical and physical languages of multifractals. The concepts of fractals and multifractals have relevance to many fields of science and even arts. A significant and fascinating feature of this approach is that it provides a proper interpretation for the pattern of the two-colored (black and white) stones in terms of the numerical values of the generalized dimension and the scaling exponent. For our case, these statistical quantities can be estimated numerically from the black, white, and mixed stones, assuming the excluded edge effect that the cell form of the Go game has the self-similar structure. The result from the multifractal structure allows us to find a definite and reliable fractal dimension, and it precisely verifies that the fractal dimension becomes larger, as the cell of grids increases. We also find the strength of multifractal structures from the difference in the scaling exponents in the black, white, and mixed stones.

Kyungsik Kim
Department of Physics, Pukyong National University

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