

MIS021-06

Room:202

Time:May 22 10:15-10:30

Wind stress of fractal structure

Hiroshi Arai^{1*}, Miki Nakamura¹, Kimie Furuya², Satoshi Sakai¹

¹Human and Environ, Kyoto Univ., ²Faculty of Science, Kyoto Univ.

The concept of fractal was advocated by Mandelbrot in 1975. This succeeded in the description of a lot of objects and phenomena of the natural world that were not able to be described up to now vaguely by a new dimension of fractal dimension. However, the character that the fractal in a physical phenomenon shows had been hardly researched in a current research as for the fractal dimension of various objects and phenomena though it had been requested. The one is a research of the flow around the fractal. In the present study, it paid attention vaguely of the fractal structure, and the meaning that the vagueness showed was verified from an experimental standpoint of wind tunnel experiment by the wind tunnel of making to visible experiment and the air resistance measurement experiment. The wind tunnel experiment device was made, and it requested there, and concretely, the screen where the plane was distributed in the fractal, random, and the checker was put, the differential pressure before and after the observation and each distribution directly of the flow by the experiment of making to visible that made smoke a tracer was measured directly, and the wind drag of each sample was requested by it. As a result, the wind drag that the fractal received indicated big values next smallest in order in which it was random and was checkered though the width of the diffusion of smoke in the wind tunnel did not change so much. It compares besides, a big whirlpool is generated easily, and, therefore, this is thought that it is because the energy penalty because of the whirlpool generation is small for the fractal. After all, it can be said that the most effective distribution in the flow is a fractal that is not random that is not the checker that is regular distribution but irregular distribution, and the vaguest distribution. In a word, it has the structure that the fractal with vagueness ventilates easily most.

Keywords: fractal, wind stress