# Wavelet representation of singular function. Some applications to the spectral problems

Igor Sheipak

*Lomonosov Moscow State University*

`isheip@yandex.ru`

We consider wavelet representation of some class of functions. In particular, the Weierstrass function and the Takagi–Landsberg family of functions allow such a representation. Special attention is paid to the functions of Takagi–Landsberg family. It is shown that the wavelet representation of Takagi–Landsberg functions is directly related to affine self similarity with with lower triangular self-similarity matrices.

The Hölder exponent of Takagi–Landsberg functions is calculated. For some parameters of wavelet representation (affine parameters of self similarity) the asymptotics of eigenvalues for corresponding spectral problem for string equation, where weight is generalized derivative of Takagi–Landsberg functions is obtained.