1068-35-113 **Konstantin I. Oskolkov*** (kooskolkov@gmail.com), Department of Mathematics, University of South Carolina, Columbia, SC 29208. *On Riemann - Schrödinger function.*

Multi-fractal properties of the function

$$\Phi:\ \mathbb{R}^2 \mapsto \mathbb{C}, \quad \Phi(t,x) := \sum_{n\in\mathbb{Z}\setminus\{0\}} \frac{e^{\pi i(tn^2+2xn)}}{\pi i n^2}$$

will be discussed. It seems natural to name Φ *Riemann – Schrödinger function* because: 1) the real part of the restriction of Φ onto the line $x=0$ coincides with the famous function that was proposed by B. Riemann as *plausible* example of a continuous but nowhere differentiable function, and 2) Φ is a generalized solution of the Schrödinger equation of a free particle, $(4\pi i\partial_t - \partial_x^2)\Phi = 0$. The properties of Φ, particularly those of its' partial derivative $\partial_x\Phi$ have implications in analytic number theory – all *incomplete Gauss' sums* are "encoded" in this derivative. (Received January 15, 2011)