Hedging of European Options of Integral type
O.Glonti, O.Purtukhia

Ivane Javakhishvili Tbilisi State University, Department of Mathematics;
A.Razmadze Mathematical Institute
omglo@yahoo.com, o.purtukhia@gmail.com

The problem of European Option hedging is considered. We investigate integral type options in the cases of Black-Scholes and Bachelier financial market. It is well-known, that the Clark-Ocone stochastic integral representation formula is the effective tool for the solving of hedging problem. But in these cases there are some difficulties to use this formula directly, because integrands of payoffs are not differentiable by Malliavin. So, we solve this hedging problem using the local time of the risky asset price process.

We develop the method of hedging of some integral type European Options using the Protter and Mayer Theorem, which connects between themselves the local time of risky asset price process and the payoff of option. At first, we give the Clark stochastic integral representation formula of local time and then using the relation between payoff of option and local time, based on the stochastic Fubini theorem we obtain the Clark type stochastic integral representation of payoff of option. The received results allow us to solve a hedging problem when use of the Clark-Ocone stochastic integral representation formula is impossible, because the payoff function is not stochastically smooth.