

# THE GENERALIZED ITÔ–VENTTSEL' FORMULA IN THE CASE OF A NONCENTERED POISSON MEASURE, A STOCHASTIC FIRST INTEGRAL, AND A FIRST INTEGRAL

*E. V. Karachanskaya*

We deduce an analog of the Itô–Venttsel' formula for an Itô system of generalized stochastic differential equations (GSDE) with noncentered measure on the basis of a stochastic kernel of an integral invariant. We construct a system of GSDE whose solution is a kernel of an integral invariant connected with a solution to GSDE with noncentered measure. We introduce the notion of a stochastic first integral of a system of GSDE with noncentered measure and find conditions under which a random function is a first integral of a given system of GSDE.

*Key words and phrases:* Itô–Venttsel formula, generalized stochastic differential equation, noncentered Poisson measure, kernel of an integral invariant, stochastic first integral.

*Karachanskaya Elena Viktorovna*

Pacific National University,  
Khabarovsk, 680035 Russia.  
E-mail: EKarachanskaya@mail.khstu.ru

Received

September 8, 2013

Translated into English:

*Siberian Advances in Mathematics*, V. 25, N 3, 191–205 (2015).

DOI: 10.3103/S1055134415030049