1086-VK-734 **Ekaterina Nathanson*** (ekaterina-nathanson@uiowa.edu), Department of Mathematics, 14 MacLean Hall, Iowa City, IA 52242, and **Laurent Jay** (laurent-jay@uiowa.edu), Department of Mathematics, 14 MacLean Hall, Iowa City, IA 52242. *A Nonlinear Variation of Constants Formula for Integral Equations with Kurzweil-Henstock Integral.*

The method of variations of constants is a well-known method for obtaining solutions to perturbed ordinary differential equation (ODE). The method was first developed for linear ODEs and then generalized by Alekseev for nonlinear ODEs. Most ODEs can be reformulated as integral equations with the Riemann integral. On the other hand integral equations have a larger class of solutions and therefore can be used to model a larger class of problems. The range of described problems can be extended even more by using different kinds of integrals. Our goal is to consider integral equations with the very general one-dimensional Kurzweil-Henstock integral (also known as gauge integral and generalized Riemann integral) and obtain a corresponding nonlinear variation of constants formula. (Received September 11, 2012)