1117-35-211 **Seonguk Kim*** (ksw8755@gmail.com), 2163 17TH Ave South, Terrace Apartment, Birmingham, AL 35205, and **Yulia Karpeshina** (karpeshi@uab.edu), UAB Department of Mathematics, Campbell Hall, 1300 University Boulevard, Birmingham, AL 35205. *The perturbation formulas for Gross-Pitaevskii Equation (GPE) with periodic potential.*

In this talk, we investigate the perturbation formulas for Gross-Pitaevskii Equation (GPE) with periodic potential which is relevant to study Bose-Einstein condensate loaded into optical lattices. In the fi rst part of this study, we consider the perturbation formulas for Linear Schrödinger equation with periodic potential. In the second part, we use the results of the perturbation formulas of the linear equation to fi nd a stationary solution and its corresponding value for GPE. Here, we need a several methods, such as perturbation theory, spectral theory and successive method. (Received January 14, 2016)