1125-65-2650 **Christopher Moro*** (chrismoro13@gmail.com), **Padmanabhan Seshaiyer** and **Carmen Caiseda**. *Predicting methane concentration in the atmosphere through mathematical modeling, computation and simulation.*

The mathematics of sustainability is a current research area that generates global interest. Climate change and greenhouse gases have been at the center of scientific debate, showing a common interest of protecting our environment. Methane is identified as an important greenhouse gas with a warming radiative forcing that is 25 times greater than carbon dioxide. It is also an important gas present in the emissions from the US oil and natural gas industries. Therefore methane concentration levels are recently being discussed between these industries and the EPA to regulate methane emissions in the atmosphere. In this talk we present the mathematical modeling of methane concentration in air. We use a benchmark problem to study the convergence rate of the numerical schemes. The numerical solution of the advection-diffusion equation by the use of the Finite Difference theta-method is obtained and implemented for both: constant and linear diffusion coefficient. Finally a parameter estimation code is implemented in order to simulate best the experimental data to be obtained. (Received September 20, 2016)