1125-65-2510 **A. Bass Bagayogo*** (abagayogo@ustboniface.ca), 200 avenue de la cathedrale, Winnipeg, Manitoba R2H0H7, Canada. *Numerical Simulation of Hydraulic Fracking and Induced Earthquakes.*

The hydraulic fracking process uses high-pressure injections of fluid to break apart rock and release trapped oil and natural gas to enhance the production of hydrocarbons. Both fracking and wastewater injections can increase the fluid pressure in the natural pores and fractures in rock or change the state of stress on existing faults which produce sudden release of energy causes the seismic waves that triggered the ground to shake. Hydraulic fracturing involves not only underground injections composed mostly of water, but also a mixture of chemical additives. These chemicals range from toxic biocides and surfactants, to corrosion inhibitors and many are also used by others industries. In this talk I will provide examples of natural hydraulic fracking and situations in which fracking are used in industrial problems, I will describe the governing equations in 1D-2D as well as 3D models of hydraulic fracking, which involve a coupled system nonlinear partial-integro-differential equations as well as a free boundary condition. I will discuss the challenges for efficient and robust numerical modeling of the 2D-3D hydraulic fracking problem. The computational efficiency of these techniques is demonstrated with Symbolic-Numeric results. (Received September 20, 2016)