



NOTICE OF THESIS PROPOSAL PRESENTATION

Geodesy and Geomatics Engineering Doctor of Philosophy

James Mtamakaya

**February 19, 2010 @ 1:00 pm
Head Hall – E-4**

Supervisors: Dr. Marcelo Santos, Geodesy and Geomatics Engineering

Supervisory Committee: Dr. Richard Langley, Geodesy and Geomatics Engineering
Dr. Donghyun Kim, Geodesy and Geomatics Engineering

Chair: Dr. Sue Nichols, Geodesy and Geomatics Engineering

Harmonic Analysis of Position and Observation Residuals on the Reprocessed IGS Global Network

ABSTRACT

Unambiguous, consistent and homogeneous GPS station coordinates are the fundamental requirement in the appropriate determination of geodetic velocities that are often used for the derivation of geodetic and geophysical models for a variety of applications. Because of this, there have been significant efforts in the past decade to improve the modeling and parameterization of global GPS solutions in order to get stable and homogeneous positions and velocities. As a parallel activity to these improvements, different spectral studies have been underway to examine various IGS solutions for different reasons. One of the latest improvements is the availability of new absolute antenna phase center variations models that have been adopted by the International GNSS Service (IGS) in all their products since November 5, 2006 (GPS Week 1400). This adoption has caused changes in the IGS solution processing strategy and necessitated the reprocessing of all of the historical IGS GPS data since 1994.

Based on the new IGS strategy, the motive of this research is to investigate and identify the short and long term effects of mismodeled and unmodeled errors from known and unknown phenomena that are still impacting the reprocessed solutions (also known as REPRO 1 solution). The investigation will use the Least Squares Spectral Analysis software (LSSA) to analyze the reprocessed solutions and residuals. The LSSA will as well be used to analyze periodic signatures from lunar and solar tide effects as well as the atmospheric pressure as a way to establish possible correlation between them. Emphasis will be put on the long periodic effects with frequencies beyond 1 cycle per year as they have been least discussed in most of the previous similar studies.

Faculty Members and Graduate Students are invited to attend the 20 minute presentation