



**NOTICE OF  
UNIVERSITY ORAL**  
GEODESY AND GEOMATICS ENGINEERING

**Master of Science in Engineering**

**Yun-ta Teng**

**Monday, December 12, 2011  
10:00 am**

**Head Hall – Room E-11**

**Board of Examiners: Supervisors: Dr. John Hughes Clarke, GGE**

**Examining Board: Dr. Yun Zhang, GGE  
Dr. Jonathan Beaudoin, Coastal & Ocean  
Mapping, UNH**

**Chair: To Be Announced**

**Sector-specific Beam Pattern Compensation for Multi-sector and Multi-swath  
Multibeam Sonars**

**ABSTRACT**

Increasingly, multibeam sonar systems are using multi-sector and multi-swath to improve the resolution of seabed survey. These systems provide not only bathymetry but also seafloor backscatter products. The proper calibration of seafloor backscatter is very important and the use of multiple sectors complicates the approaches and applications to achieve sediment classification.

With the addition of sectors and multiple swaths number, the apparent seafloor backscatter is overprinted with artefacts generated by variations in the power and beam pattern of each sector, the frequency dependent propagation in the ocean (absorption attenuation), and frequency dependence reflection of the seafloor (angular response). Current backscatter output from these systems is not properly reduced to correct for these artefacts.

This thesis is mainly to illustrate the problems and solutions of beam pattern residual artefacts in backscatter images which are using Kongsberg EM2040, EM710, EM302 and EM122 systems all of which are both multi-sector and multi-swath. The benefits of software developed as part of this research are illustrated through examples of data improvement that utilize the new OMG beam pattern correction software developed herein.

**Faculty Members and Graduate Students are invited to attend this presentation.**