



Graduate Student Orientation Session

Professor Chris K Mechefske
Graduate Coordinator

Department of Mechanical and
Materials Engineering

15 September 2011



Discussion Items

- People to know in the Department
- Graduate Representatives
- Teaching Assistant jobs
- Seminar Course (MECH-897, MECH-997)
- Funding Opportunities
- Comprehensive Examinations (PhD only)
- Course Registration Details
- Safety and security
- Society for Graduate and Professional Students
- Library
- Union



People you should know

- Prof. Mike Birk – Head of Department (on Sabbatical)
- Prof. Keith Pilkey – Acting Head of Department
- Mrs. Gabrielle Whan – Department Manager
- Mr. John Dodds - Computer Systems Technologist
- Mr. Andy Bryson – Machine Shop Supervisor
- Mr. Onno Oosten – Safety Officer
- Mr. Nasser Saleh - Librarian
- Ms. Pam Asselstine - SGPS
- - Student Union
- Ms. Gayle Laporte - Graduate Assistant
- Prof. Chris Mechefske - Graduate Coordinator



Registration Details

- Students must register in primary courses sufficient for their program
- MAsC – 4 graduate level courses + thesis + Grad Seminar (a maximum of one graduate level course may be substituted with one 400 level course from any Department)
- PhD - 4 graduate level courses + thesis + Grad Seminar (at least one grad level course from outside MME, max. of one 400 level course from a Dept other than their UG degree Dept. and outside MME)
- There is no limit on the number of courses you can take from outside this Dept.



Registration Details

- Students registered in the Collaborative Program in Computational Science and Engineering or the Collaborative Biomedical Engineering Program or the Collaborative Master's in Applied Sustainability have other requirements.
- Consult your program director for more details
- Comp Sci and Eng – Prof. A. Pollard (MME)
- Collab Biomed Eng - Prof. B. Amsden (Chem Eng)
Prof. S. Waldman (MME)
- Applied Sustainability – Prof. S. Harrison (MME)



Registration Details

- M.Eng. – 8 graduate level courses or + 7 graduate level courses + project (MECH 898) (at least 4 MME courses and a maximum of two 400 level courses from any Dept.)
- Grad Seminar – attendance optional



Registration Details

- A passing grade in graduate level courses is B- (GPA 2.7 or 70%)
- **Failure of a primary graduate level course usually results in the student being required to withdraw**
- Supplemental exams are not usually offered



Registration Details

- The course instructor's signature is not normally needed for Dept. graduate level courses
- The course instructor's signature is needed for any course taken outside this Department and for all audit courses
- Some 400 level courses have capped enrollments. You will need to check with the instructor to make sure there is room before you enroll
- Any courses taken as extra to your program will be allowed only with permission of your supervisor
- Deadline to add/drop course is Monday October 3rd (includes undergrad courses)



Teaching Assistants

- TA assignments are set by Gabrielle Whan in consultation with the faculty and the students.
- Training is strongly recommended for new TAs:
 - TA training will be offered in the Department
 - Thursday September 22 and 29 from 1:30 to 2:30
 - You will be paid at the standard TA rate for attending these training sessions.
- Workshops from the Centre for Teaching & Learning are recommended for all TAs. (www.queensu.ca/ctl)



Teaching Assistants

- International graduate students whose first language is not English are strongly encouraged to be assessed for oral proficiency in English before they apply for and take up a Teaching Assistantship other than marking.
- The assessment is performed by the Centre for Teaching and Learning (CTL) and consists of a:
 - 10 minute informal oral interview
 - 5-7 minute simulated teaching presentation
 - Brief written assignment
- Further information about the English Communication Assessment (ECA) can be found at: www.queensu.ca/ctl
- Students are responsible for contacting the CTL directly to arrange a time for their assessment.



Teaching Assistants

- **SGS 802: English Language Communication Skills for Teaching Purposes**
- Twelve week non-credit course designed for International Graduate Students/Teaching Fellows who are non-native speakers of English.
- Provides students with opportunities to improve their language and communication skills within the context of their duties as Teaching Assistants
- Encourages understanding of the culture, attitudes and assumptions that prevail in the Canadian university classroom.
- To register, contact the CTL at: ctl@queensu.ca Space is limited.
- For further information: www.queensu.ca/ctl



Teaching Assistants

- **SGS 901: Teaching and Learning in Higher Education**
- The goal of the course is to foster understanding and reflection about learning approaches and effective teaching in a university setting.
- The course is intended **primarily for Ph.D. students**, particularly those who have completed their comprehensive examinations.
- Others, including master's level students and postdoctoral fellows, may attend, depending on enrolment.
- It is highly desirable that participants have some prior teaching experience (for example as a TA) and/or be acting as a TA at the time the course is offered.
- Space is limited. For further information: www.queensu.ca/ctl



Teaching Assistants

- **SGS 804: Human Research Ethics**
- Also known as Human Research Participant Protection
- Mandatory for students who will be engaged in research involving human subjects
- Web-based tutorial providing familiarity with and practical application of Canada's national standard of ethics for research
- Register via an academic change form so that it will appear on your transcript
- For further information:
www.queensu.ca/sgs/Currentstudents/CHRPP.html



Other Required Training

- **Accessibility for Ontarians with Disabilities Act**
 1. All graduate students enrolled at Queen's on or after September 2010 are required to take the online **Accessibility for Ontarians with Disabilities Act** (AODA) training prior to graduating. Successful completion of this training will be noted on each student's transcript.
 2. For further information:
<http://www.queensu.ca/qic/accessibilitytoolkit/learningenvironment/aoda.html>
 3. To take the online training, visit the Queen's Equity Office website at: <http://www.queensu.ca/equity/content.php?page=CSOnlineTraining> and follow the instructions



Seminar Courses (MECH-897, MECH-997)

- This course is compulsory for all MASc and Ph.D. students
- M.Eng. students are welcome to attend
- Materials Research students (and others) may attend the Materials Seminars in Nicol Hall
- Attendance will be taken.



Seminar Courses (MECH-897, MECH-997)

- Students in the Collaborative Biomedical Engineering program present as part of the HMRC seminar series (CBME 802). Slightly different rules from MECH 897/997.
- Students in the Collaborative Master's in Applied Sustainability program present as part of the CMAS seminar series (CMAS 897). Slightly different rules from MECH 897/997.
- All students registered in CBME 802 or CMAS 897 need not register in MECH 897/997



Seminar Courses (MECH-897, MECH-997)

- NOTE: students in all the “special” programs must attend the McLaughlin Hall or the Nicol Hall seminars any week that they are not at a “program” seminar.
- The CBME students will need to attend in the years they are in MME after the first year of their Master’s and after the second year of their PhD (as CBME 802 requires seminars only during the first year of a Master’s and only during the first two years of a PhD)



Seminar Courses (MECH-897, MECH-997)

- Each research graduate student must present at least one seminar during their program at Queen's (typically closer to the end of their studies than the beginning)
- Carlo Scalo is organizing the presentation schedule for the McLaughlin Hall seminars (McLaughlin Hall rooms 315 and 312, Thursday 1:30pm)
- Hossein Seyedrezai is organizing the presentation schedule for the Nicol Hall seminars (Nicol Hall room 232, Tuesday 11:30)



Seminar Courses (MECH-897, MECH-997)

- Graduate Seminars start on 6 October 2011
- Weeks where Graduate Seminars are not scheduled will be used for guest seminars (watch for email announcements)
- Sign-up process will be announced shortly (self select date, specify research area, title not required yet)
- Sign up for asking questions (two separate weeks, note seminar topic area)
- Visit
<http://me.queensu.ca/graduate/seminars/mechseminar.php>



Seminar Courses

The Rules

- MASC presentations – 15 mins (10 mins for questions)
- PhD presentations – 25 mins (20 mins for questions)
- All presenters must find at least three professors to attend and mark their presentation/abstract



Seminar Courses

The Rules

- Abstracts must be submitted at least one week before your presentation
- Abstracts must be submitted to the appropriate TA
- Abstracts must be properly formatted
- Abstracts are distributed to all graduate students and Faculty one week before presentation

Sample Abstract

See also: MME
homepage
(Graduate)

Reduction of MRI Scanner Acoustic Noise using a Micro-perforated Panel Absorber

Michael Li

Department of Mechanical and Materials Engineering, Queen's University, Kingston, Canada

Synopsis

The trend toward higher field strength is worsening the noise problem in MRI. A Boundary Element Method simulation showed that a micro-perforated panel acoustic absorber can significantly reduce MRI noise in the scanner bore. The impedance function of the absorber was used to predict the sound attenuation effect. However, the absorption coefficient functions calculated according to Maa's theory do not reflect the absorbing effect of a micro-perforated panel absorber in a cylindrical duct such as an MRI scanner bore because the expression of impedance of air gap is based on the assumption of plane waves.

Introduction

MRI scanner noise has long been a concern for patient health and patient safety [1]. Depending on scanner main magnetic field strength and the type of imaging sequences being used sound levels within a scanner can be as high as 123-132 dB(A). The trend toward higher background magnetic field strength is worsening the noise problem. Work has been done to characterize the acoustic noise in the scanner bore. Various measures have also been investigated to attenuate the noise. However, these measures are either extremely costly or only modestly successful. We have studied the possibility of implementing a micro-perforated panel absorber in the MRI bore to reduce the acoustic noise. This paper presents some of our findings using computational analysis.

Methods and Results

Acoustic characteristics of a micro-perforated panel absorber were first described using Maa's theory [2,3]. A solid model of the absorber for an MRI scanner bore was developed for this study (Figure 1). Acoustic impedance functions and absorption coefficient functions of an absorber with various design parameters were calculated using MATLAB. Referring to Figure 2 and 3, a micro-perforated panel absorber can be designed for wide band absorption (absorber 1) or narrow band absorption (absorber 2 and 3). Figures 4, 5 and 6 show the change of absorption coefficient relative to the diameter of the hole (d), to the thickness of the plate (t) and to the thickness of the air gap (D) respectively, with all other parameters unchanged. Boundary Element Method (BEM) analysis was carried out with LMS VirtualLab Acoustics to compute the sound field in the scanner bore for the above mentioned three absorbers. Figures 7, 8 and 9 show that these absorbers significantly reduce the sound pressure levels in a wide frequency range and at all locations along the duct centerline.

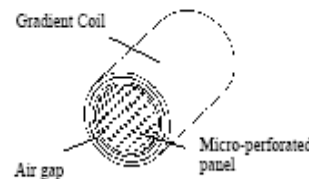


Fig. 1. Solid model of the absorber

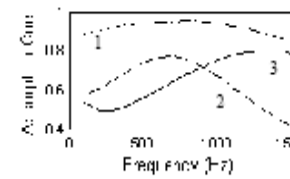


Fig. 2. Absorption coefficient functions

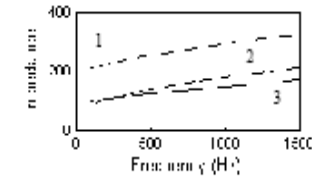


Fig. 3. Impedance functions

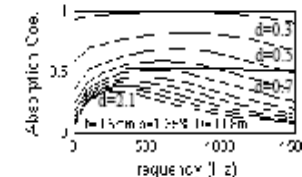


Fig. 4. Absorption coefficient vs. hole diameter

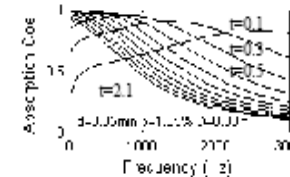


Fig. 5. Abs. coeff. vs. plate thickness

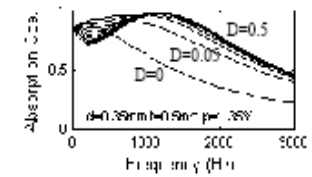


Fig. 6. Abs. coeff. vs. air gap thickness

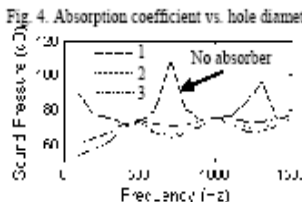


Fig. 7. SPL at the isocenter

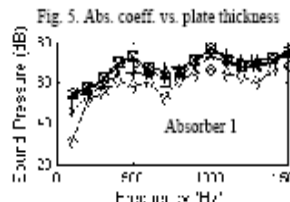


Fig. 8. SPL at 11 points along the centerline

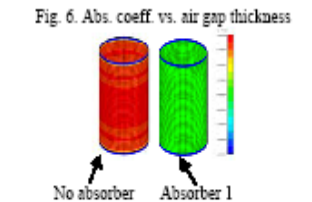


Fig. 9. Acoustic mode of 700Hz in the duct

Conclusions

The BEM Simulation results show that a micro-perforated panel absorber can significantly reduce MRI noise in the scanner bore. The impedance function of the absorber can be used for predicting the sound attenuation effect of the absorber. However, the absorption coefficient functions calculated according to Maa's theory do not reflect the absorbing effect of a micro-perforated panel absorber in a cylindrical duct such as an MRI scanner bore because the expression of impedance of air gap in Maa's theory is based on the assumption of plane waves. A new absorption coefficient function for cylindrical micro-perforated panel absorbers needs to be developed based on Maa's general theory.

References

[1] Quirk ME, Letendre AJ, Clements RA, Lingley JF. Anxiety in patients undergoing MR imaging. *Radiology* 170, 463-466 (1989). [2] Maa DY. Theory and design of micro-perforated panel sound-absorbing constructions. *Scientia Sinica* XVIII (1), 55-71 (1975). [9] Maa DY. Potential of microperforated panel absorber. *J Acoust Soc Am* 104 (5), 2861-2866 (1998).



Name of Speaker: _____
 Date: _____
 Title: _____

	Sat	Unsat	Comments
Introduction <ul style="list-style-type: none"> captures attention outlines presentation indicates purpose/goals and scope of the project identifies contribution to field 			
Content <ul style="list-style-type: none"> logical order short/concise background and explanation of relevant theory identifies progress made (focus) stays on topic 			
Conclusion <ul style="list-style-type: none"> recaps purpose/goals and reflects on current status of the work outlines planned future work gives recommendations 			
Organization <ul style="list-style-type: none"> logical flow in the presentation smooth transitions between topics stays within the time limits 			
Presentation (Oral) <ul style="list-style-type: none"> clear pronunciation/grammar appropriate volume enthusiastic and interested 			
Presentation (Visual) <ul style="list-style-type: none"> professional appearance A/V aids used effectively 			
Questions <ul style="list-style-type: none"> questions addressed confidently and thoughtfully 			
Abstract <ul style="list-style-type: none"> content – logical and complete clear presentation 			

Pass: _____ or Needs to Repeat: _____

Name of Marker: _____



Seminar Courses

Some Tips

- Read the Grad Seminars website information
- Look at the audience during your presentation (this helps hold their attention)
- Speak loudly enough (most people should use a microphone)
- Do not condescend to the audience or patronize the audience
- Minimize the use of jargon and equations
- Your manner and demeanor should be professional (jokes are dangerous)



Seminar Courses

Some Tips

- Shorter is better (1 slide per minute)
- Get to the point - State what it is you are doing and why (then how)
- Review presentation making skills on MME Grad Seminars website
- Practice in front of an audience
- Reference work done by others (pictures, equations, etc.) to avoid plagiarism
- Avoid fraud
- Number your slides



Seminar Courses

Some Tips for the Audience

- No sleeping
- No reading (or working on assignments, or marking assignments, etc.)
- No open laptops, phones, etc.
- State your name and lab/research group before you ask your question



Funding Opportunities

- Ontario Graduate Scholarship (OGS) and NSERC (Natural Science and Engineering Research Council) Scholarship competitions will start soon. (Queen's pays NSERC winners a \$5k top up in the first year of the NSERC award)
- Deadlines are typically mid-October. Watch your email for this information.
- Submission of application forms: NSERC (on-line only), OGS (on-line or as hard copy).
- If you qualify for these awards and do not apply you cannot be considered for other Queen's internal awards.



Comprehensive Examinations

- New Ph.D. Students are required to take Part A of their comprehensive examinations in mid January
- Part A consists of three oral examinations: 2 covering undergraduate subjects plus one covering your major field of research
- You should already be discussing this with your supervisor (timing and subject areas)
- Part B is a “thesis proposal” and is undertaken within 16 months of initial registration in the program.



Safety & Security

Do not work alone in labs after regular hours or on week-ends - have a buddy

If working alone in an office after hours - notify Queen's security

Act on regular safety training emails (WHIMS, chemical, nuclear, first aid, etc.)

Be aware of safety procedures in your lab and discuss these with your supervisor)

Be careful walking at night on and around campus (use AMS Walk home, Campus Safe Walk, Lone Worker program, etc.)



Graduate Representatives

- **External** – Sits on SGPS council to represent the Department and attends Departmental meetings to represent the graduate students
- **Internal** – Attends Departmental meetings and Departmental committees to represent the graduate students
- **Materials** – same as Internal; attends Departmental meetings representing the needs of the students in Materials Research group



Graduate Representatives

Current reps:

- External Grad Rep – Jerome James
(graduating soon)
- Internal Grad Rep - Kazi Ahmmed
- Materials Grad Rep - Yasir Idrees

Please talk to me or Ms. Gayle Laporte if you are interested in these positions and we can provide more details.



Mech Hockey

Tuesdays 4:00 – 5:00

Invista Centre, Rona Ice Pad

Rides are available

Starts Sept 21



Society for Graduate and Professional Students (SGPS)

- SGPS website - <http://www.sgps.ca>
- SGSR website – <http://www.queensu.ca/sgr>
- Health and dental plan (out of country coverage)
- Opt-outable fees
- International student identity card (ISIC)
- Travel cuts
- Ufile (tax)
- Housing services
- Career services
- Bursary and awards
 - Conference expense bursary
 - Emergency student fund