Accelerator mass spectrometry (AMS) - principles and some applications

Below follows information about the AMS essay

If you need some of the slides shown at the lecture, please contact Kristina (Kristina.Stenstrom@nuclear.lu.se)
Accelerator mass spectrometry (AMS) - principles and some applications

Today’s lecture:

• Introduction to $^{14}$C and AMS – tandem-AMS versus single stage AMS (SSAMS)

• Introduction to applications of AMS

• Instructions for your assignment:
  * literature study
  * writing scientific paper
  * oral presentation

We will decide topics, groups, deadlines and days for oral presentation today!
The assignment includes:
- a literature study,
- writing an essay (about 2000 words),
- an oral presentation (about 15 minutes) and
- an oral opposition on one of the co-student’s essays (about 5 minutes).

The work is performed in pairs.
Choose one of the following suggestions of AMS applications, or make a suggestion of your own (see e.g. in the paper by Fifield)

- AMS in archaeology
- Cosmic ray studies and calibration in radiocarbon dating
- AMS in geology
- AMS in oceanography
- AMS in glaciology
- Extraterrestrial applications of AMS
- AMS in medical technology (e.g. microdosing and mass balance studies)
- AMS for studies in occupational medicine
- Bombpeak dating (e.g. forensic science, regenerative medicine)
- AMS in aerosol science
- $^{14}$C from nuclear power

Fifield KF: Accelerator mass spectrometry and its applications.  

K Stenström, M Sydoff, S Mattsson: Microdosing for early biokinetic studies in humans.  

You may need further references for your specific topic. If you need help, contact Kristina ([kristina.stenstrom@nuclear.lu.se](mailto:kristina.stenstrom@nuclear.lu.se), office: B201)
How to write the essay

The essay should be scientifically written of high quality. The target group is your co-students.

Please observe that each report should contain a description of the principle of AMS: tandem-AMS as well as single-stage-AMS (SSAMS) should be described.

Include references and do not copy what anyone else has written (produce your own text from the knowledge you gain when reading articles etc). This is very important (copying someone else’s text is considered as cheating).
• All papers should be submitted to URKUND to protect your own and others copyrights!

For information and instructions, see

and

Papers should be submitted to Kristinas URKUND adress:
kristina.stenstrom.lu@analys.urkund.se
According to a report (swe) from the Swedish National Agency for Higher Education (HSV) the most common cases dealt with by the disciplinary boards at Sweden's universities are cheating by plagiarism. It is a serious problem that has increased the last few years, perhaps most because of the extended possibilities of downloading educational related material from the Internet.

Many universities have acknowledged the problem of plagiarism and have taken measures against it, such as using URKUND.

URKUND provides a service that can be used to deal with this problem. The Service has been developed in co-operation with the Pedagogical Department at Uppsala University and consists of a system for submission of papers, reports, essays and other written material. By using URKUND as a student you make sure that no one can use your work for plagiarism purposes. The system has both a preventive effect and controlling function and this makes it very difficult for your work to be illicitly used without it being detected.

This is what you do

1. Type your work in your word processor of choice (taking into account any requirements made by your teacher/Professor) with a minimum of 400 characters. If you have not received any instructions on which file formats you can use you will find a list of those approved by URKUND here on your left.

2. E-mail your document to your teacher/Professor’s analysis address as an attached file. URKUND will not accept e-mails without an attachment.

3. When you have successfully submitted your document you will receive a confirmation letter in return. If this is your first time submitting a document through URKUND you might want to click on the link to register your name and adjust your language settings.

(Please note that if your university/school uses URKUND through an LMS the above items won’t concern you. You will submit your document through the LMS normally and will not notice the use of URKUND unless it is noted in the LMS submission guidelines.)
Important dates

• **Today:**
  – find someone to work with,
  – make your choice of topic and tell Kristina, preferably before the end of the class, or email to kristina.stenstrom@nuclear.lu.se.

• **8 February:**
  – Deadline for submission of paper to Kristina (Kristina.Stenstrom@nuclear.lu.se)
  – Deadline for submission of paper to URKUND (kristina.stenstrom.lu@analys.urkund.se)

• **11 February:** Kristina distributes papers for opposition

• **15 February:** Oral presentation (see next page)
Oral presentation

• 15 of February:
  – Oral presentation and opposition
  – Times decided:
    » Fri 15/2 9.00-10.00
    » Riccard/Fredrik: Medical technology
    » Anders H/Patrik: $^{14}\text{C}$ from from nuclear power
    » Simon/Ola: Bomb peak dating
    » Fri 15/2 10.15-11.00
    » Ben/Michael: Extraterrestrial applications of $^{14}\text{C}$
    » Anders Nyholm/Agne: Solar/geomagnetic activity
Disposition of the essay

Look at the following paper for inspiration!


Use the reference system of the this paper!
References in the essay according to reference system in the journal Mass Spectrometry Reviews

Example:

In the text there is a reference to a paper by Purser and co-authors, published in 1977. It is written in the text as:

“One important discovery was that $^{14}$N does not form negative ions (Purser et al., 1977).”

In the reference list at the end of the document the references are alphabetically ordered in the following format:

Authors. Publishing year. Title of paper. Journal title followed by journal number: page numbers.

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Each paper should include:

- An appropriate title
- Names of authors
- E-mail addresses of authors
- An abstract (here you give a short summary of the paper)
- The following headings
  1. Introduction (in this section you provide an adequate background and state the objectives of the paper)
  2. Accelerator mass spectrometry (this is the Method section where you describe tandem AMS and SSAMS: pictures can preferably be included)
     - 2.1 Tandem AMS
     - 2.2 Single Stage AMS (SSAMS)
  3. “Your topic” (here you describe your topic with proper references)
  4. Summary and conclusions
- References at the end of the paper (see previous slide)

IN TOTAL ABOUT 2000 WORDS
Please use spelling and grammar check before submitting the paper!!!