

## Undergraduate thesis projects (exjobb): Elemental analysis of atmospheric particles at Hyltemossa forest site through X-ray fluorescence

**Summary:** Do you want to contribute to improving the quality of the air that we breath? The Lund University Aerosol Laboratory (<https://www.design.lth.se/om-institutionen/forskningslaboratorier/aerosollab>) seeks students to work with a recently acquired “Xact” device for time resolved on-site measurements of metal abundances in particle matter. We are now launching a project which will use this novel technique at LU. In addition to the specific goals of the project, our aim is also to verify the “Xact” data against reference techniques.



*Xact 625i XRF.* Particles are deposited on a filter tape reel. As the tape advances, the deposited particles are irradiated to produce X-ray fluorescence spectra from which elemental abundances are deduced.

### Project: Particulate matter source apportionment at forested site

The regional background forest field site Hyltemossa (<https://www.icos-sweden.se/hyltemossa>) operated by LU features a comprehensive suite of instruments for physical and chemical characterization of airborne particles. The Xact will be the next addition to the station’s measurements. It will provide elemental composition data for airborne particles, including but not limited to metals. Due to the connection between the elemental composition in particles and their sources, we can use statistical tools to deduce the sources of the pollution. With the addition of the Xact, Hyltemossa will be one of the most well-equipped stations in Europe for source apportionment. Accurate source apportionment is a necessary tool for targeted air pollution legislation aiming to reduce specific source emissions. This is motivated by the fact that air pollution still kills hundreds of thousands of Europeans annually.

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Tentative start: September 2022

### Who should apply?

A background in one of the following fields is required: physics, chemistry, environmental science, meteorology, geology, or similar (ask if uncertain). Previous experience or education relating to aerosol particles and/or X-ray analytical techniques is a plus. We can accommodate up to two students in each project and will tailor the projects depending on the number and profile of the selected students. This is an experimental thesis project, but modeling components can be included in the work also.

Email Adam Kristensson for further discussion.

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