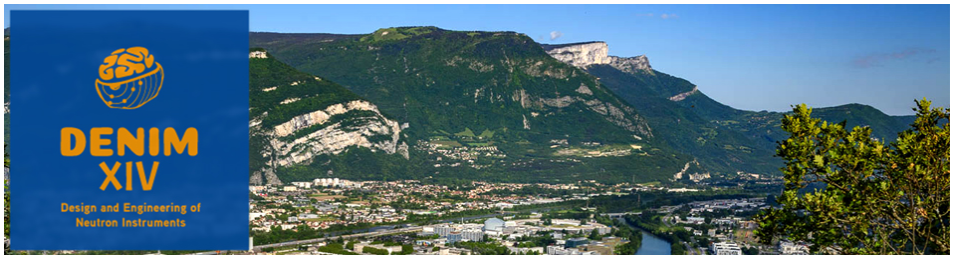

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The VESPA Secondary Spectrometer: Conceptual Design Developments

Tuesday, 21 October 2025 14:30 (15 minutes)

VESPA is a vibrational neutron spectrometer under development at the European Spallation Source. As an indirect-geometry instrument, VESPA will have several key components such as HOPG crystal analysers and beryllium filters in the path of the neutrons between the sample and the detector. These components pose significant engineering challenges in a limited space, such as complex shapes, relatively large components with different operational environments and a staged installation of modules, each with a different orientation with respect to gravity.

One example is the beryllium filters and their supporting systems. For scientific performance the neutron pathlength through the beryllium needs to be maximised for a range of neutron path angles. When accommodating built in collimation blades between the beryllium slices, fitting 8 of these rotated around the beam axis produces some strange shapes, including no perpendicular surfaces. To perform their filtering function, the beryllium filters must be kept below 100K, which puts thermal contraction, heat leaks and risks of condensation into the growing list of design requirements which need to be considered before a concept for their mechanical design can be deemed feasible.

This summary will cover some of the conceptual design developments and ongoing engineering analyses on VESPA that aim to strike balance between the scientific and practical needs of different components in isolation and as part of the wider spectrometer system.

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