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Experimental evaluation of vibrational sensitivity in the Veritas spectrometer arm

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We present a vibration study of the ten-meter-long Rowland spectrometer arm at the VERITAS beamline at MAX IV, aiming to assess how mechanical vibrations influence experimental quality. Using the width of the spectral peak recorded by the DLD8080 detector from Surface Concept as a quality metric, we introduced vibrations to the spectrometer structure and correlated the resulting rotational amplitudes of the grating to the detector readout. This approach allowed us to directly evaluate the influence of mechanical disturbances on energy resolution. By focusing on the detector output rather than vibration levels alone, we gained insight into the relative significance of vibrations compared to the cumulative effect of all other noise sources (detector electronics, optical imperfections, etc.), providing practical guidance for beamline scientists to improve their instrumentation.

Footnotes

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