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PAL-XFEL beamline updates and Plans for the second HX beamline

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The PAL-XFEL at Pohang Accelerator Laboratory in South Korea provides the best performance and stability for atomic—and femtosecond-level spatiotemporal resolution. Currently, one FEL line each at the hard X-ray and soft X-ray beamlines is in operation, and ten experimental techniques are available for XFEL sciences in physics, materials, chemistry, and biology.

After seven years of user operation, the PAL-XFEL's fundamental research programs have been stabilized and well established. We now need more specialized experimental setups and measurement techniques to facilitate future sciences and industrial applications of XFELs in energy, quantum materials, etc. In addition, the PAL-XFEL reached the maximum available user beamtime after the second half of 2023 with 24-hour-based support. However, the competition for user beamtime remains high due to the limited number of beamlines and insufficient user beamtime at the PAL-XFEL.

To resolve these issues, we have strongly proposed adding the second hard X-ray FEL line (HX2) to the PAL-XFEL to enhance its operational efficiency and scientific capability. Construction of the HX2 line is expected to begin in 2025.

I will share the latest detailed design results for the HX2 and explore ways to enhance the competitiveness of the PAL-XFEL by adding the FEL line.

Primary author: EOM, Intae (Pohang Accelerator Laboratory)

Presenter: EOM, Intae (Pohang Accelerator Laboratory)

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