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Status of the EuXFEL photon diagnostics

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The European XFEL facility has entered user operation in September 2017. Since that time the baseline photon diagnostics are in routine operation, delivering online monitoring of pulse energies, beam position, and transverse beam profile. More advanced diagnostics such as monitors for spectral and temporal properties were also commissioned in the meantime. This presentation reviews the operational diagnostics devices in the three SASE undulator beamlines, and provides details about new diagnostic capabilities such as MHz-rate spectral and temporal monitoring at hard and soft x-rays, measurements for undulator system optimization, studies of high-repetition rate effects with pulse-resolved intensity monitors, novel diamond diagnostic detectors, absolute pulse energy measurements with calorimeters and gas-based monitors, and application of photon diagnostics for special machine operation modes and studies such as hard x-ray self seeding, two-color lasing and harmonic lasing.

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