

Summary of x-ray beam parameters and available setups at the ESRF –EBS extreme condition beamlines^a

| Facility endstation | X-ray diagnostic | HP Device | Max. Beamsize (μm FWHM) | Energy range (keV) | Max. flux | Max. energy res. (eV) | Min. acquisition time | Detection system | |
|---------------------|------------------|---------------------------------|-------------------------------------|--------------------|--|-----------------------------------|------------------------------------|---------------------|--|
| ESRF-EBS | ID06 | XRD | LVP | 500 | 17-54 | 10^{13} /s | 1 | ms (XRD) | Pilatus 2M |
| | ID09 | XRD, XES | DAC Shock (350 mJ Laser) | 25 | 5 - 18 | 10^9 /p | 0.5 | 100 ps (XRD) | CCD Rayonix Von Hamos |
| | ID15a | XRD | DAC | 0.3 | 20 - 100 | 10^{13} /s | 40 | ms (XRD) | Pilatus3XCdTe CMOS SDD |
| | ID15b | XRD | DAC (RH, cryo, portable LH) | 7 | 30 | 10^{13} /s | 1 | ms (XRD) | Eiger 2 |
| | ID12 | XAS, XMCD | DAC (Cryo) | 2 | 2 - 15 | 10^{12} /s | 0.3 | 0.5 (XAS) | Si photodiode SDD |
| | ID14 | NFS, NIS, SMS | DAC (Cryo, LH) | 3 | < 100 (NIS) < 40 (NFS) 14.4 (SMS) | 10^{14} /s | 10^{-4} (NIS) 10^{-4} (SMS) | 0.5 h (SMS) | APD |
| | ID19 | HSR, μCT | HP, GG, SHPB, Shock (6 J Laser) | 10^3 | 15-150 keV (μCT) 30 keV (BI) | PB: 10^{16} /s | Polychr. | 100 ps (HSR) | Indirect X-ray imaging |
| | ID20 | XRS, XES, RXES, RIXS | DAC | 10 | 4 - 20 | $5 \cdot 10^{13}$ /s | 0.025 | 1 h (XRS) | 72 or 5 CAS Von Hamos APD Maxipix |
| | BM23 | XAS, XRF | DAC (RH, Cryo, d) | 3 | 5 - 40 | 10^{10} /s | 0.4 | 1 min (XAS) | Ionchambers SDD 5 CAS Pilatus 1M |
| | ID24-DCM | XES, XRD XAS | DAC (LH, RH, Cryo, d) | 0.3 | | 10^{13} /s | | 1 sec (XAS) | |
| | ID24-HPLF | ED-XAS | Shock (100 J Laser) | 5 | 5 - 28 | $3 \cdot 10^{14}$ /s 10^4 /p | 0.5 | 100 ps (XAS) | XH FRELON |
| | ID27 | XRD, XRF XAS, μCT | PEP, DAC (RH, Cryo, LH) | 0.15 | 15-60 | 10^{14} /s PB: 10^{16} /s | 1 | μs (XRD) | Eiger 9M PCO Edge, DIMAX, SDD |
| | ID28 | IXS XRD | DAC (RH) | ~ 25 | 17.8-23.7 (IXS) | 10^{10} /s | 10^{-3} | 20 min | Cd(Zn)Te PILATUS3 1M Si |

Note: Given values are corresponding to the main technique at each beamline. Please contact the beamline scientists for more detailed information as the new EBS beamline parameters have not yet been published and no reference can be given at this stage.

Abbreviations are as following for each column from left to the right: **XES**, X-ray emission spectroscopy; **NFS**, nuclear forward scattering; **NIS**, nuclear inelastic scattering; **SMS**, synchrotron moessbauer spectroscopy; **HSR** = high speed radiography; **μCT** = micro Contrast Tomography; **XRS**, X-ray Raman scattering; **RXES**, resonant X-ray emission spectroscopy; **RIXS**, Resonant inelastic X-ray scattering; **ED-XAS**, energy dispersive XAS; **IXS**, inelastic X-ray scattering; **LVP**, large volume press; **RH** = resistively heated DAC; **Cryo**, cryogenically cooled DAC; **LH**- laser heated DAC; **d** = dynamic compression DAC; **HP**, Hadean press; **SHPB** = Split-Hopkinson pressure bar; **GG** = gasgun; **BI** = bunch imaging; **PB**= pink beam