

# MAX IV – scientific level

## Storage ring (ca 500 m in circumference)

The main storage ring will operate at 3 GeV with full energy injection and top-up. The emittance is well below 1 nm Rad. 20 straight sections will be available for insertion devices.

## Short Pulse Facility (SPF)

Compressed electron bunches (100 fs) directly from the linac will produce incoherent X-ray pulses. The SPF will use the linac most of the time as the top-up of the storage rings only uses a fraction of the time.

## Free Electron Laser (FEL)

MAX IV is prepared to be expanded with a laser like light source in the future. This stage of the MAX IV is not included in phase I. The FEL will most likely be based on seeding.

## Moved MAX-lab

The lower energy beamlines will be housed on the relocated MAX II and MAX III storage rings.

## Beamline

20 beamlines of 50 m each will fit on MAX IV. Area for a limited number of beamlines with significantly longer length is available. The beamlines will utilise in-vacuum undulators, elliptically polarising IDs and possibly cooled PPM undulators.

## Linear accelerator (ca 250 m long)

A normal conducting 3 GHz linac with 2 bunch compressors and ejection at three energies will be used. 34 linac sections driven two-by-two from one klystron and a SLED cavity station will allow for a maximum energy of 3.4 GeV, providing a safety margin in operation.

## Experimental station

First phase stations will include: nanofocusing (microscopy, diffraction, imaging), crystallography, Powder diffraction, microfocus Xray spectroscopy, very high resolution soft Xray spectroscopy and material science under extreme sample conditions.

## Electron gun

A photo cathode RF gun will supply the Short Pulse Facility while the storage rings will be injected from either a thermionic or photo cathode RF gun.

