

## Projection X-ray microscopy with MIRRORCLE-6X

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The MIRRORCLE-6X is a brilliant x-ray source based on a portable synchrotron. Its orbit radius is only 15cm, and its magnet is made of one set of normal conducting coils. MIRRORCLE-6X is suitable for hard x-ray imaging, particularly for a projection x-ray microscopy without using optical elements. Since the x-ray target placed in the central orbit determines the effective x-ray source size, the X-ray emitter size is extremely small as an order of micron. The X-ray brilliance is the same order as large synchrotron light sources, because the electron beam is re-circulating. X-ray radiation angle is determined by the kinematics  $1/\gamma$  ( $=85\text{mrad}$  for 6MeV), thus the irradiation field is rather large compared with conventional SR sources. Placing a 2-dimensional imaging device far from the specimen realizes the magnified projection microscopy with high space resolution. We can perform the best kind non-destructive inspections and medical diagnosis. X-rays are dominated by hard components of more than 30keV, but due to the phase contrast effect, hard constructions as well as soft tissues can be observed. We will soon have a sub-micron target for 100 times magnification. Figure.1 shows x-ray images of green pepper with different magnification observed by the imaging plate, which has 150-micron pixel size. (FCR XG-1 produced by Fujifilm Ltd.). We will report many high quality aspects of MIRRORCLE.

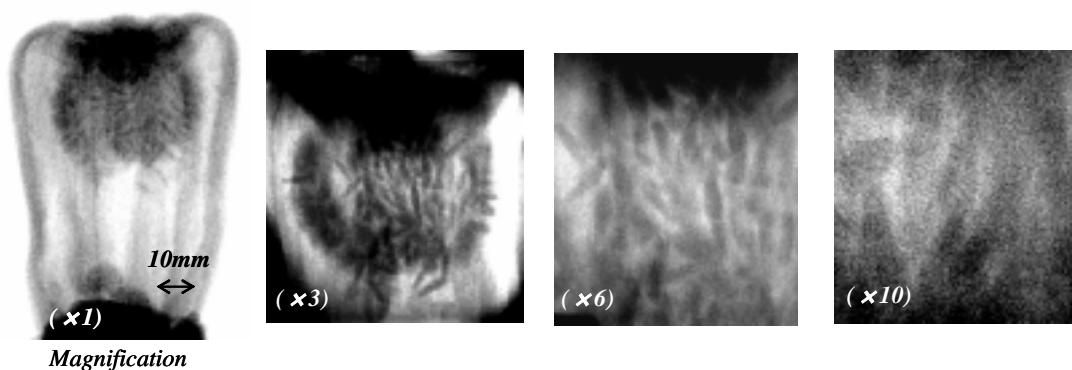


Fig.1 Ten times magnified x-ray images of green pepper taken by MIRRORCLE.