

# Medical and Imaging II (BL20XU)

## 1. Introduction

BL20XU is the second medium-length beamline in the SPring-8. Although the beamline was proposed by members of the in-house staff of SPring-8, it will be open to all users as a public beamline. The purpose of the beamline is as follows;

X-ray micro-tomography, microscopy, R&D of medical imaging technology, photon-activation-therapy, refraction-enhanced imaging, and other experiments on X-ray optics and development of optical elements.

## 2. Design of Beamline

The light source is a hybrid-type "in-vacuum" planar undulator with a periodic length of 26 mm. The maximum K-value is designed to be 2.0 in order to cover the full energy regions above 8 keV. The layout of the beamline is shown in the Fig. 1. The monochromator is a "SPring-8 standard" double crystal monochromator placed ~45 m from the source point. A liquid nitrogen cooling system developed at BL47XU will be employed. The monochromatic beam is extracted into the medical imaging center building that is located at 200 m from the storage ring. The two experimental hutches are located 80 m from the source point and 245 m from the source, respectively. The first experimental hutch is in the experimental hall of

the storage ring building, and the second is constructed in the medical imaging center building.

The first medium length beamline BL20B2 has been constructed and commissioned in 1999. BL20B2 is a bending-magnet light source beamline and is now used for medical imaging, microtomography, and X-ray topography. The role of BL20XU is complementary to BL20B2. By using a high-flux density X-ray beam from the undulator light source, although the beam cross-section is only a few mm even at the end station that is located at 245 m from the undulator, it will become possible to observe live specimens in real time. Micro-tomography is also promising for achieving sub-micrometer spatial resolution that is difficult at BL20B2 due to the lack of flux density. X-ray microscopy activities that are now being developed at BL47XU will be moved to the new beam line BL20XU, and it is planned that they will be open to public users.

## 3. Construction Schedule

Construction of the beamline will be started from spring of 2000, and will be finished by the end of FY 2000.

The optics hutch and experimental hutches will be built in May and June 2000 during the user run of the storage ring. The undulator and front-end components will be installed during the summer shutdown period of 2000. Optics and beam transport channel components will be installed in the autumn of 2000, and commissioning of the beamline will be started from the end of 2000.

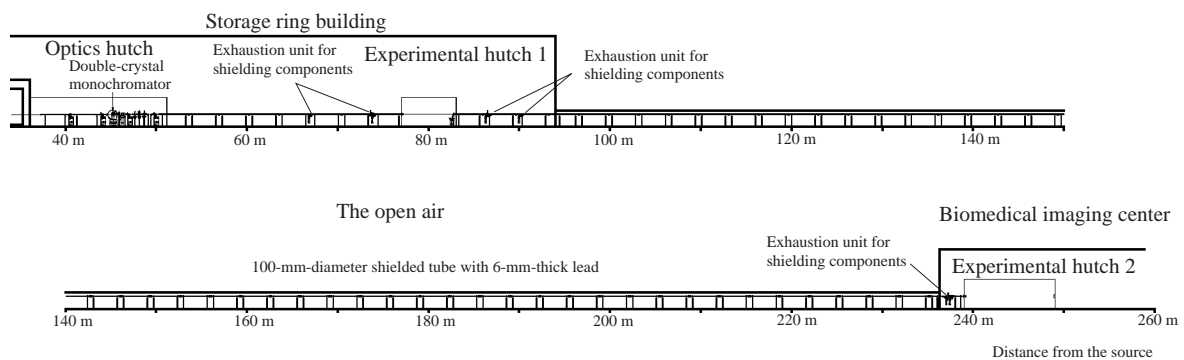


Fig. 1. Layout of BL20XU.