The Development of Hard X-ray Nanoprobe by Montel Mirrors at Taiwan Photon Source

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Abstract

The hard X-ray nanoprobe facility at Taiwan Photon Source (TPS) by the nested Montel KB mirror[1,2]. Resulting from the large numerical aperture obtained by utilizing nested KB mirrors, the beamline with a moderate length 75 meters can conduct similar performance with those beamlines longer than 100 meters as shown in Figure 1. The mirrors are symmetrically places with a 45 degrees cut. The beamline optics is thus designed to take the advantage of the symmetry of mirrors such that a round focal spot is accomplished. The size and the divergence of the focus spot are simulated around 40 nm and 5.65 mrad. The whole facility including the beamline and the stations will be operated under high vacuum to preserve the photon coherence as well as to prevent the sample from unnecessary environmental interference. A SEM in close cooperation with laser interferometers is equipped to quickly locate the position of the sample. The test system has built to study the possible difficulty combining the x-ray and electron nanoprobe. This endstation is scheduled to commission in 2016. The conceptual design for the beamline, endstations and some technical issues will be reported in this talk.

Figure (left): The layout of beamline and the illustration of nested Montel mirrors. (right) The test system is built to study the possible difficulty.

Keywords – xray Nanoprobe, Montel KB mirror,SEM.

References