

# INSTRUMENTATION & TECHNIQUES

The developments of Instrumentation and Techniques at SPring-8 have come into a new stage in the sense that the recent developments are closely related to the outstanding characteristics of synchrotron radiation emitted by the ring. Considering that the important key words are “high brightness” and “high stability”, most of the recent developments effectively utilize these specific qualities.

The above features is in striking contrast to the instrumentation developed just after the commissioning of SPring-8, which could be called “first stage” because in most cases the output results were obtained just based on the high flux of SPring-8. In this sense the first stage could be characterized just by an extension of instrumentation and techniques developed at second-generation light sources.

The following section provides three examples of such developments made in the above new stage.

The first topic describes a specially designed crystal bender. The incident beam position should be very stable, because otherwise the “fixed” position may move in the vertical direction. A larger incident beam size that is typical in second-generation sources, might increase such aberrations.

The second article discusses the use of high-resolution spectroscopy on molecules. Obviously, such high resolution has been obtained just because of the coherent irradiation on the diffraction grating used, which has become feasible due to the very small vertical emittance of the stored beam.

The third topic is related to the modulation of circular polarization of undulator radiation. Although the principle of modulation spectroscopy is very clear, great care has to be taken not to disturb the position of the stored beam during the modulation. In fact, even a small movement of the position might produce “false” MCD signals. Whether this kind of “false” effect is negligible or not should be evaluated in the future.

