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New double crystal monochromator for the 0.8 to 4.0 keV range

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The UW-PSL has developed a new patented concept double crystal monochromator for instruments operating in the low energy range of 0.8 to 4.0 keV radiation. PSL is presently engaged in a collaborative project with the Pohang Light Source in Korea by providing the internal mechanism for a DCM with PSL supplying the vacuum chamber and scan drive.

The concept utilizes a straight arm linear/rotating link called the "broomstick" that is a cotangent generator. Coupled to the broomstick is pair of unique half angle mechanisms that rotate the crystals at half the angle of the broomstick while maintaining crystal parallelism during the scan rotation. An external linear drive to one crystal through a bellows assembly provides the only required input for operation of the monochromator other than crystal angular adjustments by manual or piezoelectric means.

The instrument is capable of operating at Bragg angles from 8 to 80 degrees and is UHV rated for vacuum in the 1.0E-10 Torr range.