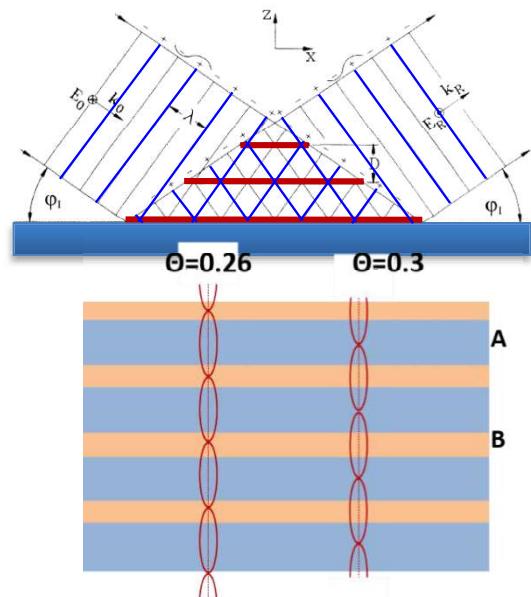
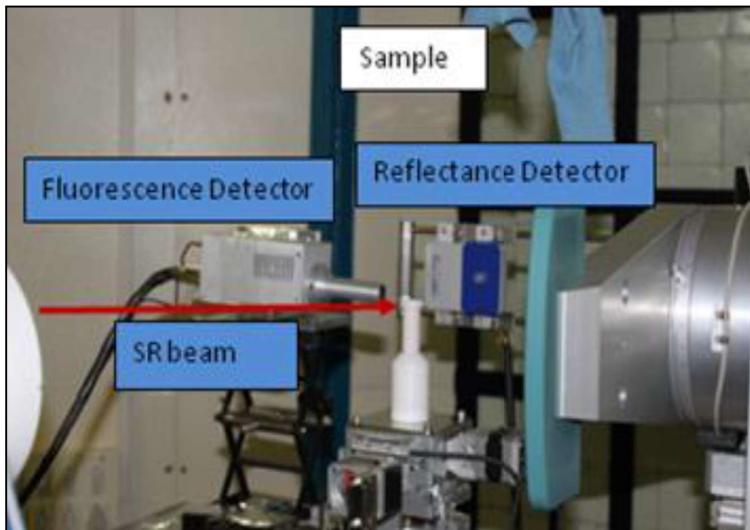


- Facility for grazing incidence XAS measurements



To cater to the large community of thin film and multilayer devices in various laboratories in India, a grazing incidence XAS (GIXAS) measurement facility has been developed at the Energy Scanning EXAFS beamline (BL-09). In this setup a 2-circle goniometer with a 5-axis sample stage is used to orient the sample, where the sample is kept at the centre of the goniometer and two detectors have been used for simultaneous fluorescence and reflectance measurements on the samples (left panel). A standing wave pattern is generated within a multilayer or a specially designed thin films system, due to the interference between the incident wave and waves reflected from the multilayer interfaces when X-rays are incident on a multilayer structure at a grazing angle of incidence higher than the critical angle (right panel top), positions of the nodes and antinodes of the standing wave inside the multilayer being precisely defined by the grazing angle of incidence (right panel bottom). Since maximum electric field at the antinode regions ensures maximum absorption of X-rays in those regions and hence maximum fluorescence XAS signal, XAS measurement at that particular grazing angle of incidence yield average information preferentially from those regions only. The correct grazing angle of incidence on the sample is ascertained by the reflectivity measurement while XAS measurement is done by collecting the total fluorescence measurement by a Si drift detector. An ionization chamber detector is used for measuring the incident flux. The set-up is extremely useful for non-destructive investigations on the buried interfaces of thin film multilayers devices which are very important in deciding their performance.

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