



Contribution ID: 43

Type: **Poster**

NCD-SWEET Beamline Upgrade and Realignment

The SAXS/WAXS Experimental End station Beamline (NCD-SWEET) at ALBA Synchrotron has undergone a comprehensive upgrade and a full realignment in order to perform demanding Small Angle X-ray Scattering (SAXS) and Wide Angle X-ray Scattering (WAXS) experiment requirements. The former Double Crystal Monochromator (DCM) has been replaced by a new Channel-Cut Monochromator (CCM) which improves the beam stability and reduces the vibration amplitudes under 1% of the beam size. In the recently installed CCM the diffracted beam is 12 mm upward unlike the DCM, in which the exit beam was 30 mm downward. This entails to realign the beamline components to a new beam height. The SAXS/WAXS end station has been also upgraded by introducing improved mechanical elements like a sample table and a SAXS detector table with sub-micron resolution movements. The beam conditioning optics has been also enhanced adding new in vacuum components like an on axis sample viewing system or a set of refractive beryllium lenses for micro focusing the beam. The new optical layout and the new equipment installation required a complete characterization, consisting in metrology and fiducialization processes, as well as survey and alignment at the final installation place according to the reference network maintaining the beamline consistency and the coherence with the accelerator machine.

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