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Materials science research at Indus beamlines

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Indus 1 and Indus-2 are India's only two synchrotron radiation sources, designed and developed in India. Both these machines were designed in the early 1990s, with Indus-1 being operational since 1999 and Indus-2 was operational since 2005. Indus-2 is a 2.5 GeV, 200 mA machine, and Indus-1 is a 450 MeV, 125 mA machine. Currently, Indus-2 has 18 operational beamlines, out of which 16 are for users and 2 beamlines are specifically designed for machine diagnostics. Indus-1 has 7 operational beamlines. These beamlines have attracted a large number of users from the Indian academia and industries over the last several years and currently over 950 user experiments of carried out annually with about 175+ publications in peer reviewed international journals from the work carried out at Indus beamlines. Among the operational beamlines, 2 beamlines, namely, Angle Resolved Photo Electron Spectroscopy beamline and X-ray Magnetic Circular Dichroism beamline, are designed and operated on insertion devices, and the remaining beamlines of Indus-2 are designed on bending magnets. 7 more beamlines (out of which 3 are on insertion devices) are in various stages of development. Materials research in general, has been the primary area of interest among the user community at Indus, although in recent years, the protein crystallography community and the Indian pharmaceutical industry has also been using these facilities extensively. Experiments related to projects of national importance like the Indian Space Research Organization's (ISRO) lunar missions, Chandrayaan-1 and Chandrayaan-2 have also been carried out at Indus. In the talk, some of the details of these beamlines and a few important results based on experiments carried out at Indus in the last few years, will be presented.

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