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Integration of Robotics for High-Throughput, Automated Screening and Data Collection at IMCA-CAT at the Advanced Photon Source. K.P. Battaile, A.M. Mulichak, I. Koshelev, J.L. Muir, K.S.M. Favale, A. Bertling, L.J. Keefe, IMCA-CAT, Illinois Institute of Technology, c/o Argonne National Lab, 9700 S. Cass Ave., Bldg 435A, Argonne, IL 60439.

Pharmaceutical research and development as well as the current structural genomics projects are starting to rely on high-throughput methods for data collection. With this in mind, IMCA-CAT has moved to implement robotics on 17-ID to mount samples, automatically center cryoloops, screen samples and collect data. The system we have installed is a Rigaku/MSC ACTOR robot controlled by JDirector software. A limitation to high-throughput use of the synchrotron is the manual mounting and centering of samples. Use of the robot for these functions results in a significant time savings as well as eliminating the need to repeatedly enter and exit, and thus search-and-secure, the end station. The JDirector software is laid out in a tabbed-notebook format that is user customizable and is also integrated with beamline controls, making it ideal for MAD data collection. Recipes for data collection and screening are in XML, which can be set up off-site. Overall, the integrated robotics on 17-ID can reduce the number of people required to collect data and increase the amount of data that can be collected during an experiment cycle.