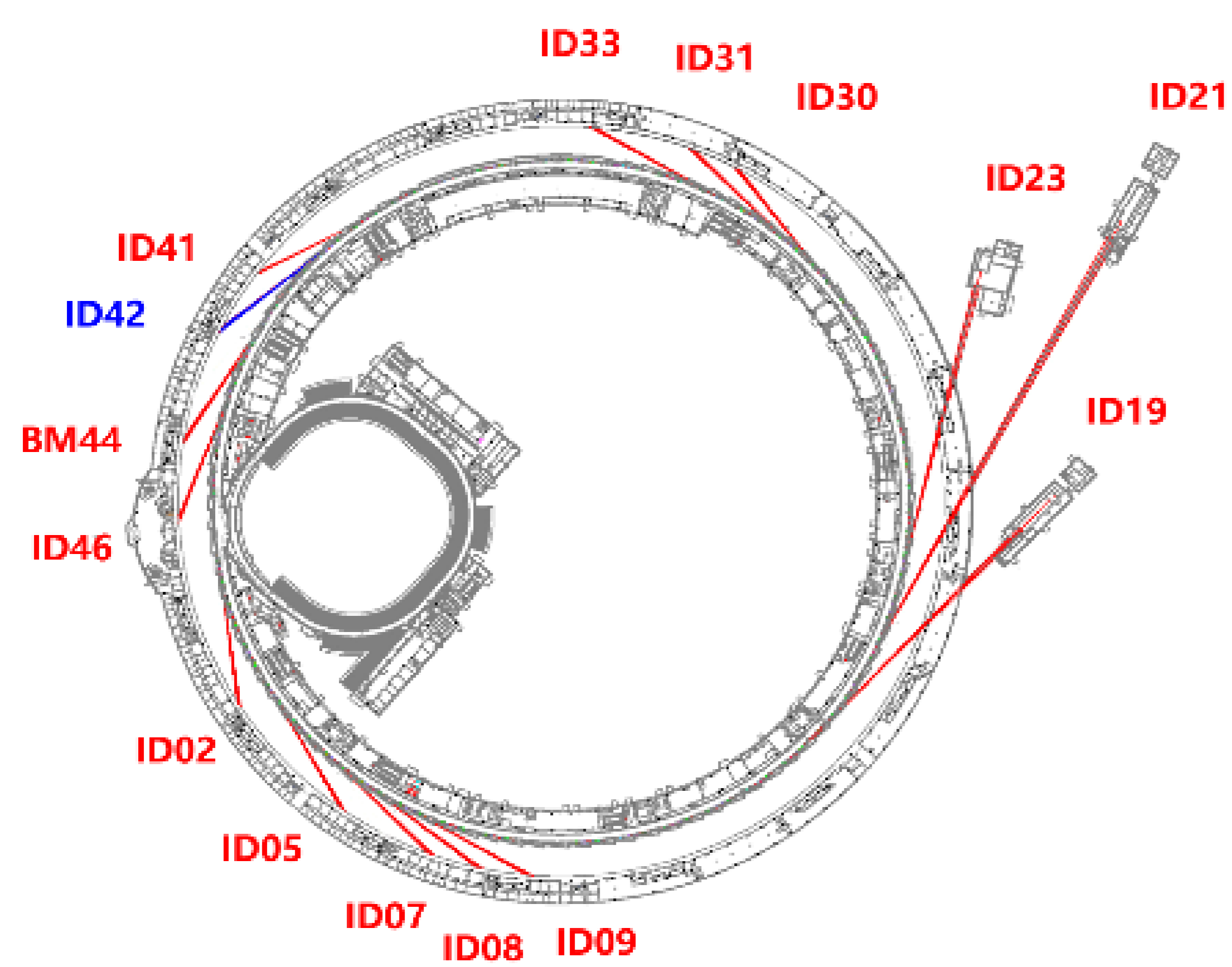


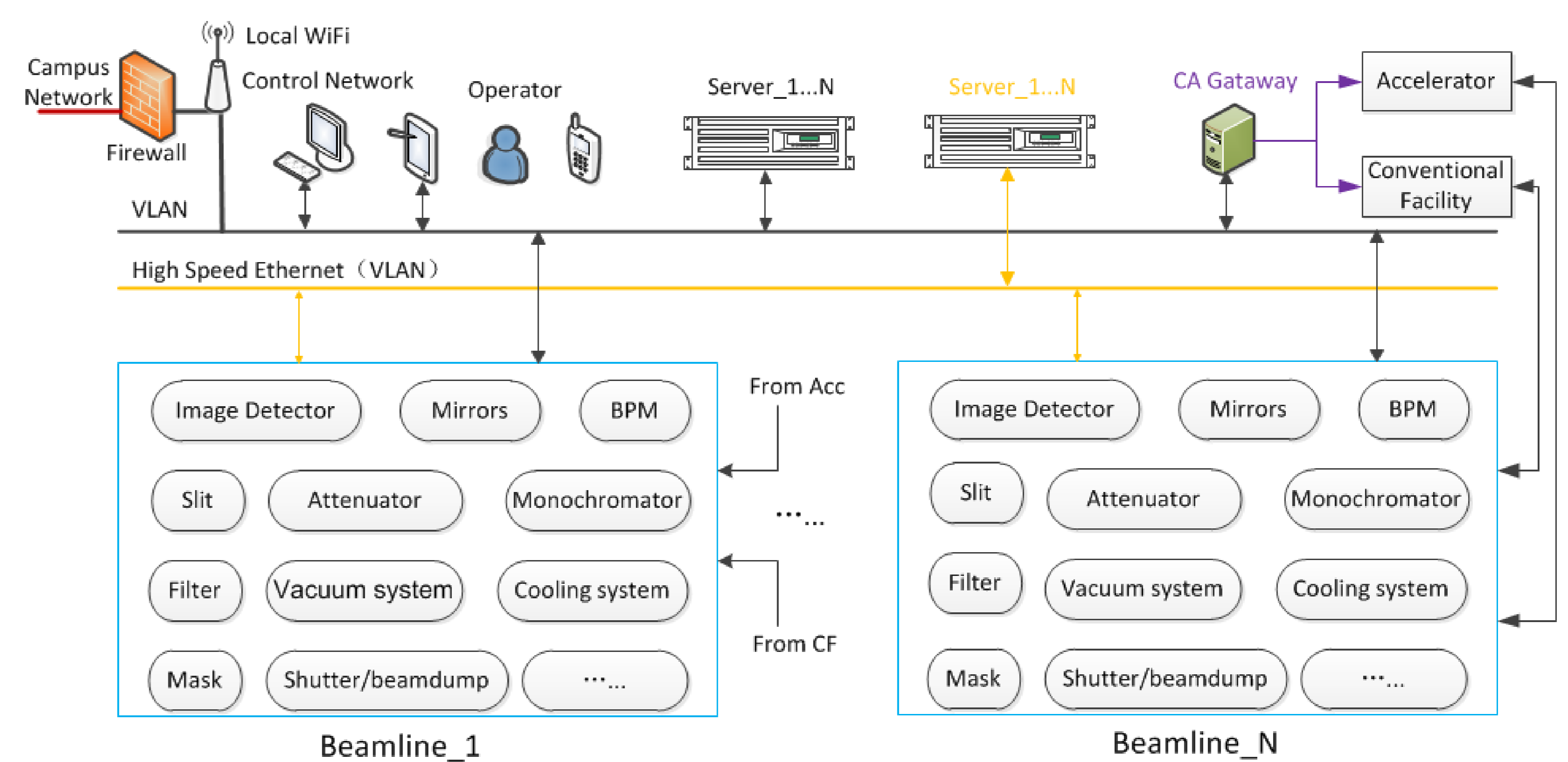
THE PROGRESS AND STATUS OF HEPS BEAMLINE CONTROL SYSTEM

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High Energy Photon Source will be the first 6 GeV high-energy synchrotron radiation facility in China. “14+1” beamlines and experimental end-stations will be constructed in the phase I. The HEPS beamline control system has been designed, based on the EPICS framework. Under limited manpower, it is a great challenge to complete the construction of 15 beamlines in the same time period. Several prototypes have been verified and developed, meanwhile, some specifications and standards have been formulated to minimizing heterogeneity.

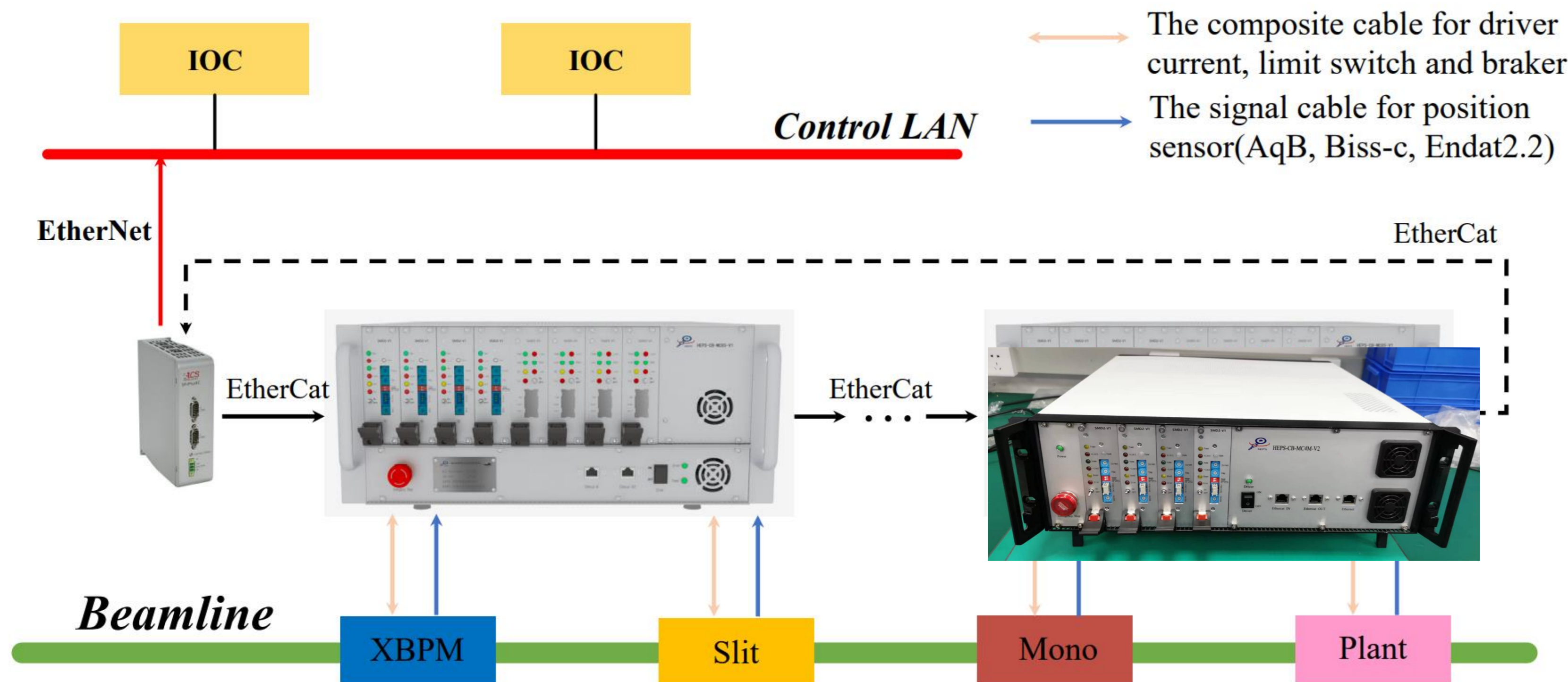


“14+1” Beamlines layout in HEPS Phase I

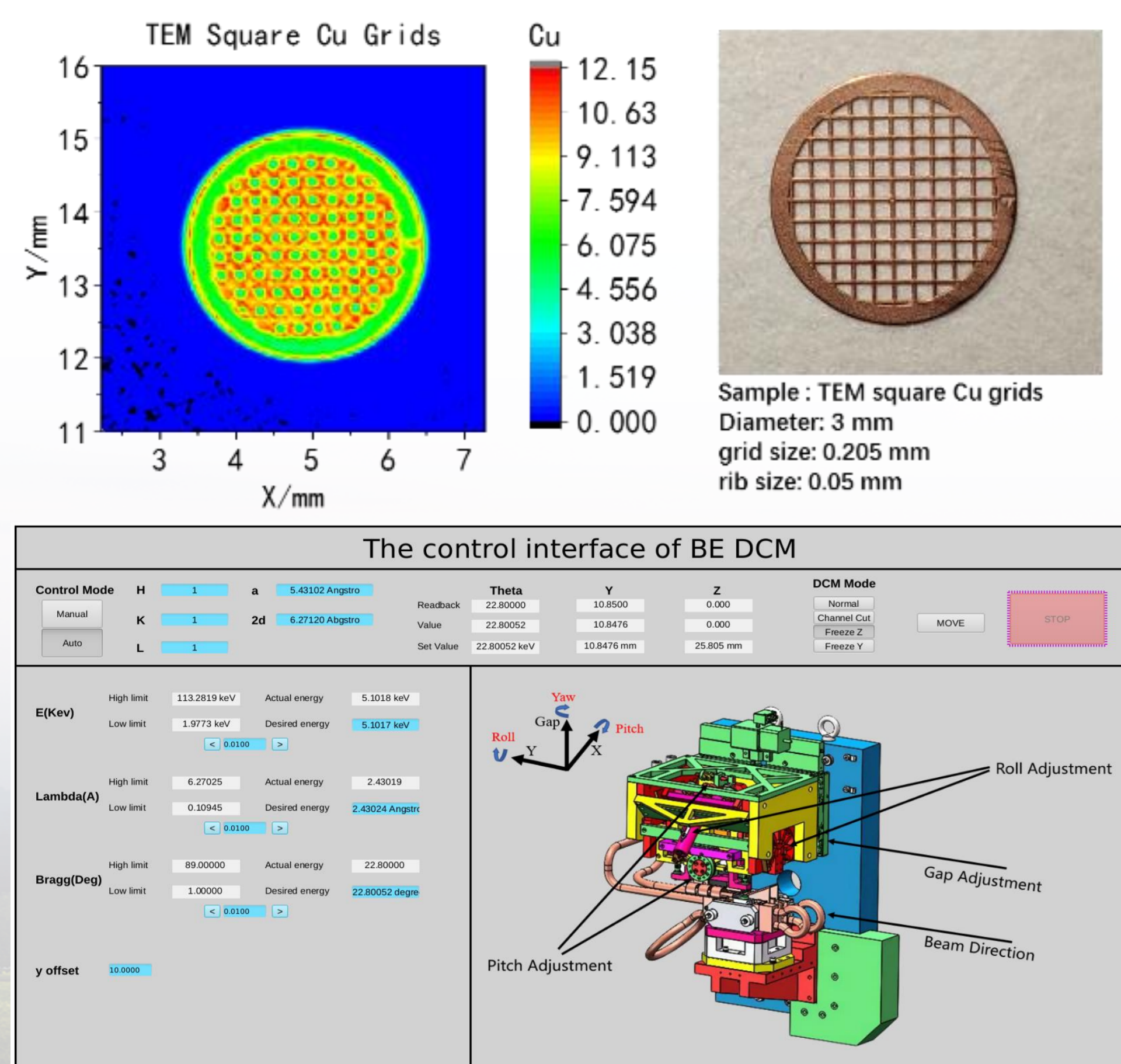
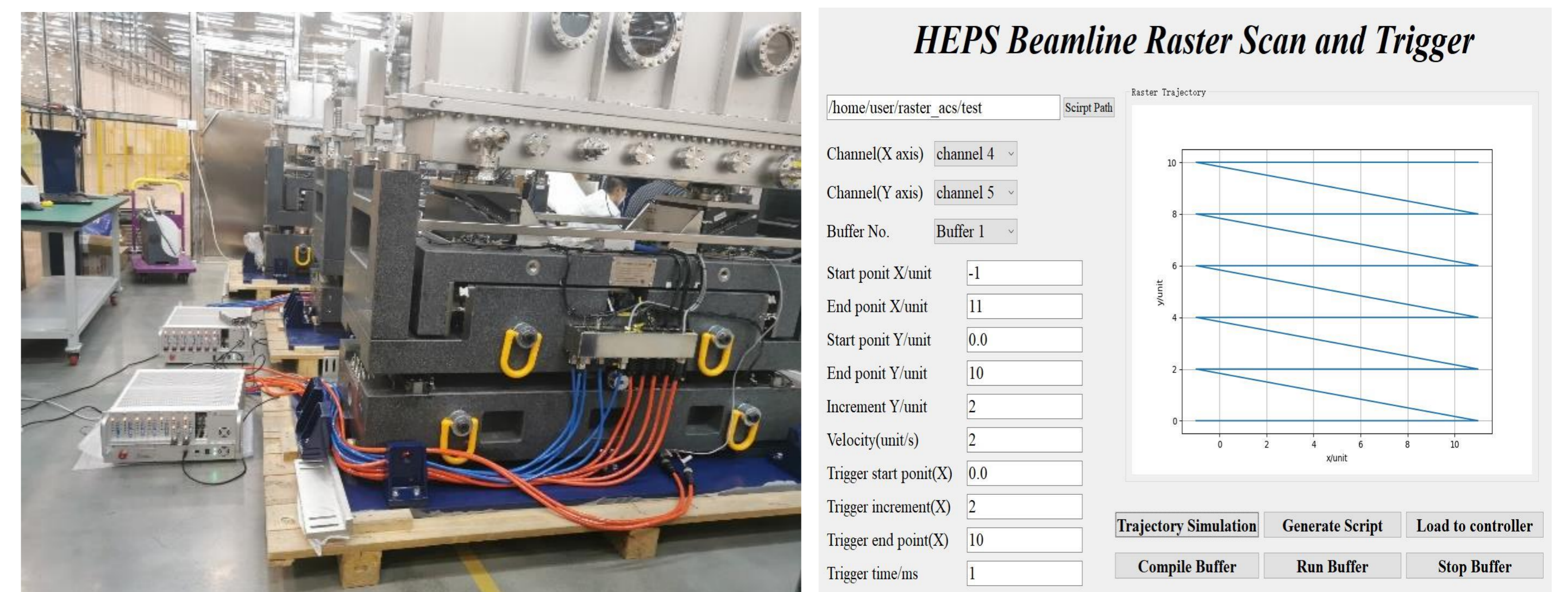


Overall structure of beamline control system

The standardization of the Stepper Motion Control System (SMCS) has been developed at HEPS. Up to 8 racks can be linked together via EtherCAT, to control a total of 64 (two-phase or five-phase) motors. The SMCS has proven to be very reliable, scalable and easy to use.



The complex motions, such as the trajectory planning and event trigger, is implemented in controller's buffers.



Many applications of core components and software modules, such as the monochromator, the CRLs translocator, fly-scan experimental planning and the information issue, have been developed and tested at the laboratory and BSRF beamline. From the end of 2024, the beamline control system will be jointly commissioned with the equipment groups and delivered for trial operation one by one. The authors would like to gratefully acknowledge those who have given a lot of valuable advice and help, during the design and construction of the control system.