

R&D of the Readout Electronics for X-ray Beam-position Feedback System Of SAPS

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For 4th generation synchrotron radiation (SR) light sources, the X-ray beam-position stability is one of the crucial factors in cutting-edge experiments. Instead of traditional passive vibration isolation techniques, active vibration isolation measures based on feedback control technology have begun to play an important role for stabilizing the beam-position. The readout electronics of the feedback control system is presented in the paper. The proposed design is based on the integration of proportion integral differential (PID) controller and system on chip (SoC) module. By using the ARM for analyzing the convergence speed of PID controller with different parameters and configuring it, the readout electronics flexibly adapts to different vibration environments. The readout circuits based on this method is implemented for southern advanced photon source, and tests are carried out in the laboratory to evaluate the readout electronics. The results show that it can weaken the influence of vibration sources below 5Hz on the beam-position.

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