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### **X-ray and optical systems for pulsed power and plasma science experiments**

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X-ray imaging and detection are useful measurements, in familiar applications like dental X-rays and less familiar ones like elemental analysis. The Pulsed Power and Plasma Science group in the Electrical and Computer Engineering department at MU has assembled an x-ray detection system in order to measure x-rays generated from electrons striking a target at several keV. The detection system will be used to study x-ray emission from a ferroelectric plasma source. A DC electron gun, whose emission is carefully controlled, will be used as a known calibration source to compare to the ferroelectric plasma source. The results of the comparison are presented. In many pulsed power experiments, large amounts of electrical noise are produced, which make measurements difficult to obtain. Optical diagnostic systems are not subject to electrical noise and are very useful in these settings. A fast optical transmitter and receiver circuit was designed and built to transmit data in a noisy environment. The design and performance of this circuit is discussed.