

XBPM temperature interlocks for DLS-II

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Synchrotron upgrades at Diamond Light Source and elsewhere are being undertaken to increase the X-ray brightness. A side effect of this is an increase in power that may be intercepted by X-ray beam diagnostics. Of particular concern are front end XBPMs, often the first component along the beam path. Diamond currently uses a temperature interlock to prevent damage to XBPMs in the event of a missteer. A PT100 monitors the temperature of a water-cooled copper aperture within the XBPM, and beam is dumped if the temperature exceeds a threshold value. However, it is well understood that using this single temperature sensor as a critical MPS component is unsatisfactory. Presented in this talk are our findings on the effectiveness and limitations of our existing front end XBPM interlocks. Diamond is aiming to re-use as much of the front end as possible after our machine upgrade, and entirely replacing our XBPM apertures and fitting additional temperature sensors is undesirable. We will also present our concepts for potential future interlock triggers, and will welcome input from DEELS on their experiences with similar problems.

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