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## **Design and analysis of a high heat load pin-post monochromator crystal with integral water manifold**

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Conventional mini-channel water cooling geometry will not perform satisfactorily for x-radiation from a wiggler source at the Advanced Photon Source. For closed gap wiggler operation cryogenic silicon appears to be the only option for crystals in Bragg-Bragg geometry. For operation of the wiggler at more modest critical energies ( $< 17$  keV), the first crystal can be cooled by a pin-post cooling scheme, using water at room temperature as a coolant. In order to limit the water consumption to 4 gpm and hence risk of introducing vibrations to the crystal, the intensely cooled area of the crystal was matched to the footprint of the beam, leaving a less cooled area of the crystal subject to survival in a mis-steered beam but not to perform as a monochromator. The manifold design avoids large areas of high water pressure which would bow the crystal. We present here the design of a pin-post monochromator consisting of a four layer silicon manifold system and an integrally bonded 39% nickel-iron alloy base plate. A transparent prototype of the design will be exhibited. Fabrication techniques and design advantages will be discussed.