

B35

FEA analysis of diamond as IMCA's monochromator crystal

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A great deal of effort has been made in recent years in the field of undulator high heat load optics, and currently there are several tractable options [Rev. Sci. Instrum. 69, 2792 (1994); Nucl. Instrum. and Meth. A266, 517 (1988); Nucl. Instrum. and Meth. A239, 555 (1993)]. Diamond crystals offer some attractive options-water as the coolant, the use of established monochromator mechanisms, simpler monochromator design as compared to the use of liquid nitrogen or gallium. The use of diamond crystals as the optical elements in a double crystal monochromator for the IMCA-CAT and MR-CAT ID beamlines has been studied. A first crystal mounting scheme using an indium-gallium eutectic as the heat transfer medium developed in collaboration with DND-CAT and M. Hart will be presented. A FEA analysis of the IMCA-CAT ID beamline arrangement using the APS undulator A as the radiation source will be presented.