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MOLYBDENUM-99 PRODUCTION TECHNOLOGY DEVELOPMENT**

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**Test of the 90-degree Achromatic Bend Prototype for NorthStar's Mo-99  
Production Facility**

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**ABSTRACT**

Argonne is funded by the National Nuclear Security Administration's (NNSA) Office of Material Management and Minimization (M<sup>3</sup>) to assist NorthStar Medical Radioisotopes in developing an electron-accelerator-based system that produces <sup>99</sup>Mo by a ( $\gamma$ ,n) reaction on a <sup>100</sup>Mo target. This production facility will be composed of multiple pairs of linear accelerators, each pair irradiating the initial target material from the opposite direction for better efficiency and uniformity of <sup>99</sup>Mo production. To protect the accelerator components from the intense bremsstrahlung radiation coming from the opposite beam, the use of a 90-degree achromatic bend was proposed. The achromatic 90-degree bend is composed of two 45-degree bending magnets and two quadrupole magnets for chromaticity compensation. A prototype of the 90-degree achromatic bend was designed and assembled at Argonne. Test runs were performed to check the reliability of this approach. The results of these tests are presented in this report.

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