

# Development of multilayer coated replicated neutron focusing optics

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## Abstract

We have been developing multilayer coated X-ray optics for future X-ray missions using an electroformed nickel replication process to fabricate complete shells which are then coated with multilayers using DC magnetron sputtering. However, for small diameter optics the cathodes used to deposit the coatings can no longer fit inside the optic for direct deposition. Therefore we have developed an indirect coating process which allows us to achieve multilayer coatings on the inside surface of arbitrarily small diameter integral optics. The multilayer coating is applied to the mandrel and is released with the optic as part of the electroformed nickel replication process. We are now applying this same technology to fabricate multilayer coated neutron focusing optics. We present results from the first prototype multilayer coated neutron focusing optic which was recently tested at the National Institute of Standards and Technology.