Diamond Stripping Foils for the SNS

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Thin diamond foils are under development for use as H- stripping foils for the Spallation Neutron Source. The input ion beam energy will be 1 GeV, at 38 mAmp instantaneous current. Simulation tests at a 750 KeV beam indicate that the expected life of these foils will be approximately ten-fold higher than for conventional evaporated carbon foils. Because the SNS foils can be supported at most on two edges, they must be mechanically robust. The curling problem that occurs when stress-laden diamond films are released from their silicon growth substrate has been solved through preparation of corrugated foils by growth on lithographically-patterned substrates. Foil lifetime tests will be described, and further tests at Fermilab and at the PSR at Los Alamos will be discussed.

SNS is managed by UT-Battelle, LLC, under contract DE-AC05-00OR22725 for the U.S. Department of Energy. SNS is a collaboration of six U.S. National Laboratories: Argonne National Laboratory (ANL), Brookhaven National Laboratory (BNL), Thoms Jefferson National Accelerator Facility (TJNAF), Los Alamos National Laboratory (LANL), Lawrence Berkeley National Laboratory (LBNL), and Oak Ridge National Laboratory (ORNL).