

**From:** [James P. Morgan](#)  
**To:** [Kris E Anderson](#); [Yun He](#); [Rolland E Lebeau](#); [Gerald E Annala](#); [Dean A. Still](#); [Ralph E Ford](#); [George Deinlein](#)  
**Cc:** [Nathan Froemming](#)  
**Subject:** Carbon-carbon cover...the rest of the story  
**Date:** Friday, December 14, 2018 2:55:11 PM

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Hi Kris and Yun,

We had three targets with carbon-carbon (I call them graphite in the elog entries) covers back in Run II, although we didn't actually target much beam on the cover on the upper part of Run 2 Target 3 because we used a pair of larger disks that had a titanium cover that were in the same assembly. Through the period that we used the graphite covers, the spot size was consistent around a sigma of 0.15 mm, but beam intensity was increasing. The carbon-carbon cover on Run 2 Target 2 held up fine with around 5E12 per pulse, Run 2 Target 4 was devastated with 7.5E12 per pulse. So that increase of 50% in beam intensity made a huge difference in longevity of both the targets and graphite cover. Here are links to pertinent elog entries and a picture below the links of what I mean by "devastated".

Jim

Description of Run 2 Target 2 with the graphite cover when it was installed in February 2003

<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pts&action=view&page=82&load=>

Elog entries about initial experience of target with graphite cover in October 2003

<http://www-bd.fnal.gov/cgi-mach/machlog.pl?action=view&nb=pts&page=116&hilite=graphite>

Removal of Run 2 Target 2 in July 2004, replaced with Run 2 Target 3

<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pts&action=view&page=155&load=>

Run 2 Target 3 end of life August 2005, replaced with Run 2 Target 4

<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pts&action=view&page=199&load=>

Run 2 Target 4 end of life May 2006

<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pts&action=view&page=227&load=>

