LCLS PM Block cleaning magnetic moment measurements

Scott Anderson - 5/4/2010

An undulator had desiccant spilled on it causing rusting of some of its parts, including some of its permanent magnet (PM) blocks. In a test to see if the blocks could be cleaned without demagnetizing them, one damaged block’s magnetic moment was measured before and after the cleaning process. The block chosen was number 03328.

The magnetic moment of block 03328 before cleaning was 4.056483e-005 +/- 7.0238e-010 Tm^3 and after was 4.0568800 +/- 9.1652e-010 Tm^3. The temperature difference between the before (20.04 oC) and after (19.99 oC) measurements was 0.05 deg C, which would make the after measurements appear stronger by 0.0045% , so the temperature corrected after magnetic moment is 4.0566974 Tm^3. The temperature corrected ratio of PM 03328’s magnetic moment after to before the cleaning process is 1.000053 +/- 0.000040. This shows that there was no change in the magnetic moment due to the cleaning process.