

Circles of Confusion of MHATT-CAT Kappa Goniometer

Don Walko, MHATT-CAT

d-walko@anl.gov

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The circles of confusion (COC) of MHATT-CAT's Newport kappa goniometer were measured as part of the on-site acceptance procedure in August 1998. After the damaging fall on September 30, 2003, the COCs were measured again on January 13, 2004, by Eric Lutton and Christian Sportiello of Newport-Microcontrole, before disassembly of the damaged diffractometer for shipping back to France. The following table presents a comparison of the measurements.

Note that the measured values of August 1998 are peak-to-peak values for the fully loaded stage. Furthermore, the COC measurements of phi, kappa, and omega were measured in several angular configurations in 1998, with the median value presented below. The angular configurations on the 2004 measurements were not recorded on the documents from which I estimated the below COC values.

Axis name	Alternate name(s)	COC (μm), August 1998	COC (μm), January 2004
phi	kphi	12	18
kappa		20	32
omega	theta, ktheta	36	35
psi	mu	8	22
nu		12	14
2theta	theta,del	40	50

Most of the differences in the above measurements could be attributed to the 2004 values being rough estimates, if not to differences in angular configuration. The psi axis is the only one whose COC is significantly greater; this may have been caused by a more subtle inconsistency in measurement, by the fall of the diffractometer, or by six years of normal use.