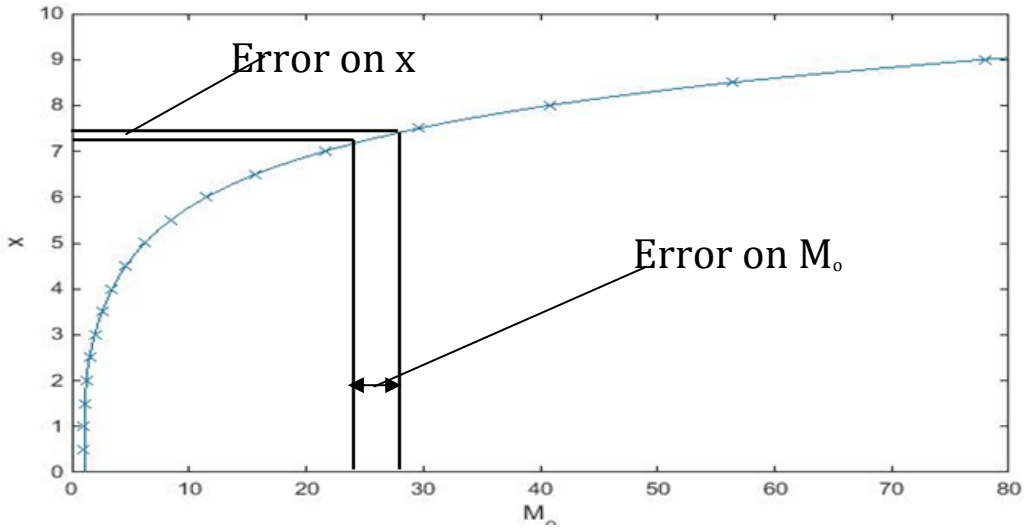

Figure 5: Calculating error on x.

The value of x for the point at which M_o is its average value minus the uncertainty on it is found using the basic fitting function. The difference between this value of x and its average value gives the error on x.

Error on Diffusivity is calculated by error propagation using partial differentiation on equation (15). The calculated errors for the three values of Diffusivity were averaged to get a final error of $\pm 2.24 \times 10^{-8}\ m^2/s$.

Error on the phase lag was obtained by error propagation on equation (13), $2.5°$. The error on x was found using a plot of$Arg|M_o|$ and x, similar to how it was calculated in the previous section (Figure 5). Using equation (15) the error on diffusivity was then calculated to be $\pm 1.84 \times 10^{-8}\ m^2/s$.

Experiment	Thermal Diffusivity	Error
Part A: Sudden Change in Temperature	$8.70 \times 10^{-8}\ m^2/s$	$\pm 0.42 \times 10^{-8}\ m^2/s$
Part B: Periodic Change in Temperature (Amplitude)	$2.12 \times 10^{-7}\ m^2/s$	$\pm 0.24 \times 10^{-7}\ m^2/s$
Part B: Periodic Change in Temperature (Phase lag)	$7.10 \times 10^{-8}\ m^2/s$	$\pm 1.84 \times 10^{-8}\ m^2/s$

5. Discussion

The results obtained from both parts of the experiment, although very close, were not within three standard deviations of each other. The reduced chi-squared values for the