1078-82-368   **Chris Soteros*** (`soteros@math.usask.ca`). *Knot reduction for a lattice polygon model of local strand passage.* Preliminary report.

From DNA experiments, it is known that type II topoisomerases can reduce the fraction of knots in DNA over that found in randomly cyclized DNA; the amount that the fraction of knots is reduced is one measure of "knot reduction". These topoisomerases act locally in the DNA by transiently breaking one strand of DNA to allow another strand to pass through (strand passage). Szafron and Soteros have used a self-avoiding polygon model on the simple cubic lattice to model this strand passage action. The details of the combinatorial and topological theory behind this model will be reviewed. Also our Monte Carlo results on how knot reduction depends on the local juxtaposition structure at the strand passage site will be reviewed. We have found correlations between knot reduction and the crossing-sign and crossing-angle at the strand passage site. Preliminary results on the effect of varying solvent quality and/or the strand passage structure on knot reduction will also be presented. (Received December 13, 2011)