

# Higher order Morita approximations for random copolymer models

Chris Soteris

`soteris@math.usask.ca`

*Department of Mathematics and Statistics*

*University of Saskatchewan*

*Saskatoon, Saskatchewan S7N 5E6*

*CANADA*

## **Abstract**

We use Morita approximations to obtain upper bounds on the limiting quenched average free energy for Dyck and Motzkin path models of random copolymer adsorption and localization. We show that a series of improved bounds can be obtained via the convergence radii of Dyck and Motzkin path generating functions which keep track of path lengths as well as more detailed path information. For adsorption, this allows us to obtain the limiting quenched average free energy very precisely at low temperatures. For localization, it allows us to obtain an improved understanding of the localization regime of the phase diagram.