Meeting: 1003, Atlanta, Georgia, AMS CP 1, AMS Contributed Paper Session

1003-60-581 **Leanna Horton*** (leanna.horton@gmail.com), **Anne Shiu** and **James Gardner**. *Palindromes Under a 1st Order Markov Model with Applications to Genetic Sequences.* Preliminary report.

Consider a stationary 4 state Markov chain $\{X_j\}_{j=1}^{n}$ with state space $\{A, T, G, C\}$ and transition matrix

$$\Gamma = \begin{array}{c} \\ A \\ T \\ G \\ C \end{array} \begin{array}{c} \begin{array}{cccc} A & T & G & C \end{array} \\ \begin{pmatrix} \Gamma_{aa} & \Gamma_{at} & \Gamma_{ag} & \Gamma_{ac} \\ \Gamma_{ta} & \Gamma_{tt} & \Gamma_{tg} & \Gamma_{tc} \\ \Gamma_{ga} & \Gamma_{gt} & \Gamma_{gg} & \Gamma_{gc} \\ \Gamma_{ca} & \Gamma_{ct} & \Gamma_{cg} & \Gamma_{cc} \end{pmatrix} \end{array}$$

with $.1 < \Gamma_{ij} < .6$ for all $i, j \in \{a, t, g, c\}$. Let M_k be the number of palindromes counted in an overlapping fashion in $\{X_j\}_{j=1}^{n}$. Using the Stein-Chen Method we show that M_k is approximately Poisson. We also derive an Erdős-Rényi type result for L_n, where L_n is the length of the longest palindrome in $\{X_j\}_{j=1}^{n}$. (Received September 23, 2004)