1086-VF-354 **Neil Sigmon*** (npsigmon@radford.edu), Department of Mathematics and Statistics, P.O. Box 6942, Radford, VA 24142, and **Rick Klima** (klimare@appstate.edu), Department of Mathematical Sciences, Boone, NC 28608. *Using Graphs to Break Ciphers in Cryptography Using Maplets.*

In cryptography, monalphabetic ciphers, which rely on a single ciphertext alphabet to encrypt a plaintext message, have for many years been known to be insecure since frequency analysis can be used to discover the key by using the most likely plaintext/ciphertext character pairs. Polyalphabetic ciphers, when first used, represented a major upgrade over monoalphabetic ciphers since individual plaintext letters were encrypted using multiple cipher alphabets. However, if the number of cipher alphabets used can be discovered, polyalphabetic ciphers are themselves vulnerable through using frequency analysis on the individual cipher alphabets. This talk discusses how polyalphabetic ciphers, in particular, the well-known polyalphabetic Vigenere keyword cipher, can be broken using graph comparisons involving the frequency distributions of certain ciphertext letters. In order to generate the graphs and perform the comparisons, a Maplet will be used. (Received September 19, 2012)