1064-05-279 **Todd Kemp**, **Karl Mahlburg**, **Amarpreet Rattan** and **Clifford Smyth*** (cdsmyth@uncg.edu). *The number of non-crossing perfect matchings compatible with a 2-coloring.*

Let the vertices V of a convex $2n$-gon be labeled 1 through $2n$ in clockwise order. Let K be the complete graph on V whose edges are straight line segments. Let $c : V \to \{0, 1\}$. Let $\phi(c)$ be the number of non-crossing perfect matchings of K that are properly colored by c. Interestingly, the $\phi(c)$ are precisely the non-zero moments of the circular operator of free probability (and also the renormalized asymptotic moments of a Gassian random matrix.)

We'll show the bound: $\phi(c) \leq C^{(\lceil n/k \rceil)}(k)$ where $2k$ is the number of x such that $c(x) \neq c(x+1 \mod 2n)$ and where $C^{(a)}(b) := \frac{1}{ab+1}\binom{b(a+1)}{b}$ is the Fuss-Catalan number. (Received September 14, 2010)