

Meeting: 1004, Bowling Green, Kentucky, SS 4A, Special Session on Knot Theory and Its Applications

1004-57-234 **Yuanan Diao*** (ydiao@uncc.edu), Department of Mathematics and Statistics, UNC Charlotte, Charlotte, NC 28223, and **Claus Ernst** and **Uta Ziegler**. *The ropelength of closed braids*. Preliminary report.

For a knot or link K , let $L(K)$ denote the rope length of K and let $Cr(K)$ denote the crossing number of K . An important problem in geometric knot theory concerns the bound on $L(K)$ in terms of $Cr(K)$. It is well known that there exist positive constants c_1, c_2 such that for any knot or link K , $c_1 \cdot (Cr(K))^{3/4} \leq L(K) \leq c_2 \cdot (Cr(K))^{3/2}$. It is also known that for any real number p such that $3/4 \leq p \leq 1$, there exists a family of knots $\{K_n\}$ with the property that $Cr(K_n) \rightarrow \infty$ (as $n \rightarrow \infty$) such that $L(K_n) = O(Cr(K_n)^p)$. In this talk, we show that the power $(Cr(K))^{3/2}$ can be further reduced if the link K has a closed braid form such that the number of crossings in the braid is of the same order as $Cr(K)$. (Received January 25, 2005)