Meeting: 1003, Atlanta, Georgia, SS 11A, AMS Special Session on Riemannian Geometry, I

1003-57-573 **John M Sullivan*** (`jms@isama.org`). *Ropelength and Distortion of Knots using Essential Secants.*

Following Kuperberg, we define which subarcs of a knotted curve are (topologically) essential, creating the knottedness. Using a result of Denne—that knots have essential alternating quadrisecants—we can show the ropelength of any knot is at least 15.66, within 5 percent of the known upper bound for the trefoil. By considering the shortest essential arc of a knot, we can show that its (Gromov) distortion is at least 3.99, more than twice the value for an unknotted circle. This is largely joint work with Elizabeth Denne and Yuanan Diao. (Received September 23, 2004)