1015-35-217   **Pavel Exner**, **Evans Harrell** and **Michael Loss*** (`loss@math.gatech.edu`), School of Mathematics, Georgia Tech, Atlanta, GA 30332-0160. *Global mean-chord inequalities with application to isoperimetric problems.*

We consider a pair of isoperimetric problems arising in physics. The first concerns a Schroedinger operator in two dimensions with an attractive interaction supported on a closed curve; we ask which curve of a given length minimizes the ground state energy. In the second problem we have a loop-shaped thread in three dimensions, homogeneously charged but not conducting, and we ask about the (renormalized) potential-energy minimizer. Both problems reduce to purely geometric questions about inequalities for mean values of chords of the curves. (Received February 06, 2006)

1