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Total absolute curvature of nonclosed curves

A classical theorem by Fenchel gives a lower bound of the total absolute curvature of closed curves in the Euclidean space. In this talk, we give a lower bound of the total absolute curvature of nonclosed curves with fixed boundary conditions (initial and terminal points and directions). When the curve is closed, the lower bound of the total absolute curvature does not depend on the length of the curve. In contrast, for nonclosed curves with fixed boundary conditions, it depends on the length of the curve. We give the lower bound explicitly in terms of the length and the boundary condition of the curve. Similar problems for curves in the sphere and the hyperbolic space will be also discussed.