INTEGRAL MENGER CURVATURE

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In knot theory, knots are equivalence classes of a certain equivalence relation. Each knot class consists of many different representatives, some of them being more complicated, some others – less complicated. In order to find the simplest, optimal shapes for knots, one considers certain functionals known as knot energies. An example of such functional is integral Menger curvature

$$\mathcal{M}_p(\gamma) = \int_\gamma \int_\gamma \int_\gamma \frac{1}{R(x,y,z)^p} d\mathcal{H}^1(x) d\mathcal{H}^1(y) d\mathcal{H}^1(z),$$

where $R(x, y, z)$ denotes radius of the unique circle passing through x, y, z.

In the talk I will discuss some basic properties of $\mathcal{M}_p$, as well as the connection to Sobolev-Slobodeckij spaces. Stress will be put on the scale invariant case $p = 3$.