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球面上简单闭曲线的等周不等式

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Isoperimetric Inequality of Simple Spherical Closed Curve

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摘要 等周不等式反映了周长固定的闭曲线其周长和所围区域面积之间的关系。本文通过适当选取球面上单位法向量的方向, 即由球面指向球心, 得到球面曲线曲率及测地曲率的表达式, 利用曲面上的高斯-波涅公式在球面上推广了该不等式, 得出了球面上简单闭曲线的等周不等式:
$$L \geq 2\pi - \sum m_i = 1(n - \alpha)R^2 - \sigma R \tan \theta_0.$$

关键词: 球面闭曲线; 等周不等式 高斯-波涅公式; 测地曲率

Abstract: Isoperimetric inequality shows the relation of perimeter and area that the closed curve encircles with its perimeter fixed. In this paper, the author get curvature and geodesic curvature of spherical closed curves by selecting properly the direction of unit normal vector on the sphere, that is, from sphere to the center of its. Using Gauss-Bonnet Formular the isoperimetric inequality of simple spherical closed curve is promoted.

Keywords: simple spherical closed curve isoperimetric inequality Gauss Bonnet Formular geodesic curvature

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