On a Class of Linear Weingarten Surfaces

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ABSTRACT

We consider a class of linear Weingarten surfaces of revolution whose principal curvatures, meridional k_μ and parallel k_π, are satisfying the relation $k_\mu = (n + 1)k_\pi$, $n = 0,\ 1,\ 2,\ \ldots$. The first two members of this class of surfaces are the sphere ($n = 0$) and the Mylar balloon ($n = 1$). Elsewhere we have parameterized the Mylar balloon via the Weierstrassian elliptic and zeta functions. Here we give five parameterizations describing the third type of surfaces when $n = 2$. The obtained explicit formulas are then applied for the derivation of the basic geometrical characteristics of the surfaces.