

Linear Weingarten Surfaces in \mathbf{R}^3

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We study linear Weingarten surfaces in \mathbf{R}^3 , namely, those immersions ψ from a surface S in \mathbf{R}^3 , such that a linear combination of its mean curvature and Gauss curvature is constant, that is, $2aH + bK = c$, for some real numbers a, b, c , not all zero. By using the conformal structure induced by $a\psi - bN$, we derive two fundamental elliptic partial differential equations which involve ψ and the Gauss map N , when $a^2 + bc > 0$. The result gives a harmonic representation and optimal estimates of the height and curvatures. One characterizes the spherical cap as he achieves these bounds. These results are joint work with J. A. Gálvez and A. Martínez.