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STABILITY OF GENERALIZED LINEAR WEINGARTEN HYPERSURFACES IMMERSED IN THE EUCLIDEAN SPACE

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Abstract: Given a positive function F defined on the unit Euclidean sphere and satisfying a suitable convexity condition, we consider, for hypersurfaces M^n immersed in the Euclidean space $\mathbb{R}^{n+1}$, the so-called k-th anisotropic mean curvatures H_k^F, $0 \leq k \leq n$. For fixed $0 \leq r \leq s \leq n$, a hypersurface M^n of $\mathbb{R}^{n+1}$ is said to be (r, s, F)-linear Weingarten when its k-th anisotropic mean curvatures H_k^F, $r \leq k \leq s$, are linearly related. In this setting, we establish the concept of stability concerning closed (r, s, F)-linear Weingarten hypersurfaces immersed in $\mathbb{R}^{n+1}$ and, afterwards, we prove that such a hypersurface is stable if, and only if, up to translations and homotheties, it is the Wulff shape of F. For $r = s$ and $F \equiv 1$, our results amount to the standard stability studied, for instance, by Alencar–do Carmo–Rosenberg [**1**].

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Key words: Euclidean space, Wulff shape, k-th anisotropic mean curvatures, (r, s, F)-linear Weingarten hypersurfaces, stable closed hypersurfaces.