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LOCAL RIGIDITY, BIFURCATION, AND STABILITY OF H_f-HYPERSURFACES IN WEIGHTED KILLING WARPED PRODUCTS

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Abstract: In a weighted Killing warped product $M_f^n \times_\rho \mathbb{R}$ with warping metric $\langle\,,\rangle_M + \rho^2\,dt$, where the warping function ρ is a real positive function defined on M^n and the weighted function f does not depend on the parameter $t \in \mathbb{R}$, we use equivariant bifurcation theory in order to establish sufficient conditions that allow us to guarantee the existence of bifurcation instants, or the local rigidity for a family of open sets $\{\Omega_\gamma\}_{\gamma\in I}$ whose boundaries $\partial\Omega_\gamma$ are hypersurfaces with constant weighted mean curvature. For this, we analyze the number of negative eigenvalues of a certain Schrödinger operator and study its evolution. Furthermore, we obtain a characterization of a stable closed hypersurface $x\colon \Sigma^n \hookrightarrow M_f^n \times_\rho \mathbb{R}$ with constant weighted mean curvature in terms of the first eigenvalue of the f-Laplacian of Σ^n.

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