SUBMANIFOLDS OF WRAPPED PRODUCT MANIFOLDS
$I \times_f S^{m-1}(k)$ FROM A $p$-HARMONIC VIEWPOINT

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Abstract

We study $p$-harmonic maps, $p$-harmonic morphisms, biharmonic maps, and quasiregular mappings into submanifolds of warped product Riemannian manifolds $I \times_f S^{m-1}(k)$ of an open interval and a complete simply-connected $(m-1)$-dimensional Riemannian manifold of constant sectional curvature $k$. We establish an existence theorem for $p$-harmonic maps and give a classification of complete stable minimal surfaces in certain three dimensional warped product Riemannian manifolds $\mathbb{R} \times_f S^2(k)$, building on our previous work. When $f \equiv \text{Const.}$ and $k = 0$, we recapture a generalized Bernstein Theorem and hence the Classical Bernstein Theorem in $\mathbb{R}^3$. We then extend the classification to parabolic stable minimal hypersurfaces in higher dimensions.

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Key words: Warped product, minimal submanifold, stable minimal submanifold.

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