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Rigidity and regularity of codimension-one Sobolev isometric immersions

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Abstract. We prove the developability and $C_{\text{loc}}^{1,1/2}$ regularity of $W^{2,2}$ isometric immersions of *n*-dimensional domains into \mathbb{R}^{n+1} . As a conclusion we show that any such Sobolev isometry can be approximated by smooth isometries in the $W^{2,2}$ strong norm, provided the domain is C^1 and convex. Both results fail to be true if the Sobolev regularity is weaker than $W^{2,2}$.

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