Rigidity and regularity
of codimension-one Sobolev isometric immersions

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Abstract. We prove the developability and $C^{1,1/2}_{\text{loc}}$ 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 $W^{2,2}$.