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Transcendental manifolds in real projective space and Stiefel-Whitney classes

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Abstract. It is shown that the Stiefel-Whitney classes of a smooth manifold can give obstructions to realizing this manifold as the set of real points of a nonsingular real algebraic subvariety of projective space of a given dimension, even when the manifold can be embedded as an algebraic subset of real projective space of that dimension (meaning that the corresponding real algebraic variety must have complex singularities outside the real points). This strengthens earlier results by Akbulut and King. The result is an application of more technical results concerning algebraic cycles on real varieties combined with the Barth-Larsen Theorem in complex geometry.

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