Algebraic independence of topological Pontrjagin classes

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Abstract

Classical results of Sullivan and Kirby–Siebenmann may be used to see that the map from the space BO (classifying stable vector bundles) to the space $B\mathrm{Top}$ (classifying stable bundles of Euclidean spaces) is a rational homotopy equivalence. Therefore the familiar Pontrjagin classes of vector bundles must arise from more mysterious invariants of bundles of Euclidean spaces. For bundles of d-dimensional Euclidean spaces, one may ask whether the identities among Pontrjagin classes familiar from d-dimensional vector bundles continue to hold. To everyone's great surprise, Weiss has shown that they need not. I will explain an elaboration of Weiss' results, using completely unrelated methods: there are no relations at all among (Euler and) Pontrjagin classes for bundles of d-dimensional Euclidean spaces, whenever $d \geq$. This is joint work with S. Galatius.