

# On the Thom conjecture in $CP^3$

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## Abstract

The Thom Conjecture, proven by Kronheimer and Mrowka in 1994, states that complex curves in  $CP^2$  are genus minimizers and their homology class. In  $CP^n$ , an analogous question can be asked about complex hypersurfaces. This question has been studied by Freedman in his thesis (1973), where it was shown that for  $n > 2$  and even, complex hypersurfaces are not the simplest taut submanifolds in their homology class. We show that for  $d > 4$ , smooth complex surfaces in  $CP^3$ , representing the homology class  $d[CP^2]$ , are not the simplest compact simply connected smooth 4-manifolds in  $CP^3$  representing  $d[CP^2]$ . This is joint work with Daniel Ruberman and Sašo Strle.