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Zhixu Su* (zhisu@indiana.edu), Department of Mathematics, Indiana University, Bloomington, IN 47405. *A 32 dimensional manifold which is a rational analog of the projective plane.* Preliminary report.

There are 4 kinds of projective planes: real, complex, quaternionic, and octonionic. No such projective plane exists in dimension 32, due to the nonexistence of a Hopf invariant 1 map. However, using local surgery theory, I showed there does exist a rational analog: a smooth manifold whose rational homology is rank 1 in dimension 0, 16, and 32, and is zero otherwise. Local surgery theory reduced the question to finding possible Pontryagin classes satisfying a set of congruence relations provided by Riemann-Roch integrality theorem. (Received August 25, 2008)