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4. Algebraic Geometry

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Algebraic threefolds with $\mathbf{q_1 = q_2 = p_g = 0, P_{2i} = 1}$ and $\mathbf{P_{2i+1} = 0}$

Research on threefolds with properties similar to those of Enriques surfaces ($p_g = 0, P_{2i} = 1, P_{2i+1} = 0$) has been carried out by various authors, including L. Godeaux and K. Ueno.

In addition to the already-mentioned birational invariants, Enriques surfaces S have $h^1(S, O_S) = 0$, $2K_S \equiv 0$ and contain a pencil of elliptic curves, but not all of these properties can coexist on a threefold X because, e. g., if $2K_X \equiv 0$ then $q_1 = h^1(X, O_X) > 0$.

Results of a research currently under way on threefolds with $p_g = q_1 = q_2 = 0, P_{2i} = 1, P_{2i+1} = 0$ will be presented: the purpose is to prove the existence of threefolds of this type, obtained as a nonsingular model of a degree six hypersurface $V_6 \subset \mathbb{P}^4_{\mathbb{C}}$ containing a pencil of surfaces with Kodaira dimension $= 0$ or a net of elliptic curves.