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Some new examples of smooth unirational quartic threefolds

To decide whether the general (smooth) quartic hypersurface $V_3(4) \subseteq \mathbf{P}^4$, defined over any field k, is unirational or not is one of the most difficult open rationality problem for algebraic varieties. B. Segre gave an example of a smooth unirational quartic threedimensional hypersurface which, not being rational according to Y. Manin and V. A. Iskovskikh, was the first known counterexample to the Lüroth problem. We construct some new examples of such smooth unirational quartic threedimensional hypersurfaces by determining all monoidal (i. e. having a triple point) quartic surfaces in $\mathbf{P}^3$ with separable asymptotics. We use a computer algebra system in order to make the needed computations.