▶ NURLAN KOGABAEV, *Computable dimension and projective planes.*
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In the present paper we investigate the question of possible computable dimensions of countable structures in the following familiar classes of projective planes: free projective planes, freely generated projective planes, pappian projective planes, and desarguesian projective planes.

For free projective planes the following characterization of computable categoricity have been found.

THEOREM 1. *Every free projective plane has computable dimension either* 1 *or* ω. *Futhermore, such a plane is computably categorical if and only if it has finite rank.*

It turns out that the results of Theorem 1 can not be extended to the case of freely generated projective planes.

In [1] it was shown that the class of symmetric irreflexive graphs is *HKSS-complete* in the following computable-model-theoretic sense: for every countable structure $\mathcal{A}$, there exists a countable symmetric irreflexive graph $\mathcal{G}$ which has the same degree spectrum as $\mathcal{A}$, the same $\mathbf{d}$-computable dimension as $\mathcal{A}$ (for each degree $\mathbf{d}$), the same computable dimension as $\mathcal{A}$ under expansion by a constant, and which realizes every degree spectrum $\mathrm{DgSp}_{\mathcal{A}}(R)$ (for every relation R on $\mathcal{A}$) as the degree spectrum of some relation on $\mathcal{G}$.

We construct an effective coding of symmetric irreflexive graphs into freely generated projective planes preserving most computable-model-theoretic properties and obtain the following result.

THEOREM 2. *The class of freely generated projective planes is HKSS-complete. In particular, for every* $n \in \omega \cup \{\omega\}$ *there exists a freely generated projective plane of infinite rank with computable dimension* n.

In [2] it was proved that the class of fields is HKSS-complete. We use some natural coding of fields into pappian projective planes to obtain the following theorem.

THEOREM 3. *The class of pappian (desarguesian) projective planes is HKSS-complete. In particular, for every* $n \in \omega \cup \{\omega\}$ *there exists a pappian (desarguesian) projective plane with computable dimension* n.

We also calculate the complexity of the computable categoricity problem for familiar classes of projective planes.

THEOREM 4. *The computable categoricity problem for the class of free projective planes is m-complete* Σ^0_3. *For the classes of freely generated, pappian, desarguesian and arbitrary projective planes the computable categoricity problem is m-complete* Π^1_1.

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[1] D.R.HIRSCHFELDT, B.KHOUSSAINOV, R.A.SHORE, A.M.SLINKO, *Degree spectra and computable dimensions in algebraic structures*, ***Annals of Pure and Applied Logic***, vol. 115 (2002), no. 1-3, pp. 71–113.

[2] R.MILLER, B.POONEN, H.SCHOUTENS, A.SHLAPENTOKH, *A computable functor from graphs to fields*, ***The Journal of Symbolic Logic***, vol. 83 (2018), no. 1, pp. 326–348.