On the typical full automorphism group of Biembeddings of Archdeacon type

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In his seminal paper [1], Archdeacon introduced Heffter arrays as a tool to construct explicit $\mathbb{Z}_v$-regular biembeddings of complete graphs K_v into orientable surfaces. The automorphism groups of these embeddings were later investigated in [3], where upper bounds on their size were established, and in [2], where it was shown that these bounds are attainable.

In this talk, we consider a generalization of the notion of Heffter array: the *quasi*-Heffter arrays. This framework yields 2-colorable Archdeacon-type embeddings of the complete multipartite graph $K_{\frac{v}{t}\times t}$ into orientable surfaces. We then show that the automorphism group of such embeddings is, in the generic case, precisely $\mathbb{Z}_v$.

References

[1] D. Archdeacon, Heffter arrays and biembedding graphs on surfaces, *Electron. J. Combin.*, 22 (2015) #P1.74.

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[3] S. Costa and A. Pasotti, On the number of non-isomorphic (simple) k-gonal biembeddings of complete multipartite graphs, *Ars Math. Contemp.*, 24 (2024) #P4.02.