This paper discusses some cases of the Zilber-Pink conjecture. Specifically, Conjecture 1.2 in the paper looks at the restriction of Zilber-Pink to look at the intersections of an irreducible algebraic curve $V \subset S$ which is not contained in any proper special subvariety of $S$, with a special subvariety $S_H \subset S$ of codimension at least 2 (here $S$ is a pure Shimura variety).

On one hand the paper obtains a conditional result, where Conjecture 1.2 is proven under two arithmetic conjectures. This is not an uncommon feature in the area of Zilber-Pink problems as the proofs usually rely on the well-established Pila-Zannier strategy which combines o-minimality with point counting, and it is now well-understood that the arithmetic part is usually more difficult.

But the paper also proves two unconditional cases of Conjecture 1.2 when the Shimura variety is of the form $A_g \times A_g$, where $g \geq 2$ and $A_g$ is the moduli space of principally polarised abelian varieties of dimension $g$. Theorems 1.3 and 1.4 are the first proven cases of Zilber-Pink that do not fall under the setting of products of modular curves, or of the André-Oort conjecture.

Aside from using the Pila-Zannier strategy, the proofs use previous results of the author and some recent functional transcendence results of Z. Gao [J. Reine Angew. Math. 732, 85–146 (2017; Zbl 1422.11140)].

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