Small subsquares of Latin squares

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I will talk about some work of Ian Wanless and his student Joshua Browning, and some further work that Ian and I did last month.

We are interested in the maximum number of subsquares of order m which a Latin square of order n can have, where we regard m as being fixed and n as varying and large. In many cases this maximum is (up to a constant) a power n^r, for some exponent r depending on m. However, we cannot prove that this always holds; the smallest value of m for which it is not known is $m = 7$.

A related problem concerns the maximum number of Latin squares isotopic to a fixed square of order m.