Symmetric designs of Menon series admitting an action of Frobenius groups

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Abstract: In this article we have constructed many designs of Menon series, e.g. symmetric designs with parameters $(4u^2, 2u^2 - u, u^2 - u)$, assuming that a Frobenius group of order $2u^2 + u$ or $2u^2 - 3u + 1$ acts on it in a certain way. It has been proved that there always exist orbit structures for these cases. For smaller values of u, the complete classification has been made. For $u = 3$, 10 mutually nonisomorphic designs have been constructed. If $u = 4$, there are 10 nonisomorphic designs and if $u = 5$, there are 3 nonisomorphic designs. In the case of $u = 6$, 96 mutually nonisomorphic designs are constructed using this method. The full automorphism groups of these designs have been computed in many cases.