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On Invariant Rings of Sylow Subgroups of Classical Groups

One of the main interests in Modular Invariant Theory of Finite Groups is to determine presentations of the invariant ring in terms of generators and relations. In this talk we will show how to construct a presentation for the invariant ring of the Sylow p-subgroups of the unitary groups $\mathrm{GU}(3, \mathbb{F}_{q^2})$ and $\mathrm{GU}(4, \mathbb{F}_{q^2})$. We will also discuss how one might generalize these results.