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Title:	Asymptotics of the powers in finite reductive groups
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Abstract:	Let G be a connected reductive group defined over F q . Fix an integer M ≥ 2 , and consider the power map x ↦ x M on G. We denote the image of G (F q) under this map by G (F q) M and estimate what proportion of regular semisimple, semisimple and regular elements of G (F q) it contains. We prove that, as q → ∞ , the set of limits for each of these proportions is the same and provide a formula. This generalizes the well-known results for M = 1 where all the limits take the same value 1. We also compute this more explicitly for the groups GL (n , q) and U (n , q) and show that the set of limits are the same for these two group, in fact, in bijection under q ↦ − q for a fixed M.
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