Dmitrii Kubrak* (dmkubrak@mit.edu). The growth of the number of semistable $G$-bundles on curves over finite fields.

Let $\{X_i\}$ be a sequence of smooth complete curves over $\mathbb{F}_q$ such that the genus $g_{X_i}$ grows with $i$. Then one can ask how fast the class number $h_{X_i} = |\text{Pic}^0_{X_i}(\mathbb{F}_q)|$ grows when $i \to \infty$. Weil’s conjectures give bounds from above and below: $2 \log_q(\sqrt{q} - 1) \leq \frac{\log h_{X_i}}{g_{X_i}} \leq 2 \log_q(\sqrt{q} + 1)$. In 1990’s Tsfasman and Vlădut proved that if the sequence $\{X_i\}$ satisfies some additional asymptotic properties (e.g. if $\{X_i\}$ is a tower of curves) there is a precise formula for $\lim_{i \to \infty} \frac{\log h_{X_i}}{g_{X_i}}$ in terms of some invariants $\beta_n(\{X_i\})$. Given a split reductive group $G$ we prove an analogous formula for the (stacky) number of points on the stack $\text{Bun}_{G,X_i}^0$ of $G$-bundles on $X_i$. Studying the geometry of $\text{Bun}_G$ we also prove that the asymptotic formula does not change if we restrict the count to the semistable locus $\text{Bun}_G^{ss}$. We also expect that one can replace the stacky count with the actual number of semistable $G$-bundles, but can prove this only for $G = \text{GL}_n$ at the moment. (Received September 01, 2018)