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Explicit Bounds and Heuristics on Class Numbers in Hyperelliptic Function Fields

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Abstract   In this paper, we provide sharp estimates for the divisor class number of hyperelliptic function fields. We extend the existing methods to any hyperelliptic function field and improve the previous bounds by a factor with the help of new results. We thus obtain a faster method of computing regulators and class numbers. Furthermore, we provide heuristics on the distribution of the class number. These heuristics suggest that, although the bounds are sharp, the approximation is in general far better.