Kummer theory for number fields

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Let K be a number field and let G be a finitely generated and torsion-free subgroup of $K^\times$ of rank r. I will present various results (which are joint work with Hörmann, Perissinotto, Sgobba, and Tronto) concerning the cyclotomic-Kummer extensions $K(\zeta_N, \sqrt[n]{G})$ where $n \mid N$. For example there is an explicit finite procedure to compute a positive integer C (depending only on G and K) such that the ratio between n^r and the degree of the Kummer extension $K(\zeta_N, \sqrt[n]{G})/K(\zeta_N)$ divides C. For some families of number fields I will also present concrete strategies to compute all of the above degrees.