Computing characters of groups with a solvable normal subgroup.

The so-called Burnside-Dixon-Schneider (BDS) method currently used as the default method of computing character tables in GAP and Magma is often inefficient in dealing with groups with large normal solvable subgroups. If $G$ is a finite group with a cyclic central subgroup $Z$ and $\lambda$ a linear character of $Z$, then we describe a method of computing the set $\text{Irr}(G, \lambda)$ of irreducible characters $\chi$ of $G$ whose restriction $\chi_Z$ is a multiple of $\lambda$. This method involves only $|\text{Irr}(G, \lambda)|$ conjugacy classes of $G$ and so is relatively fast. A generalization of the method can be applied to computation of small sets of characters of groups with a solvable normal subgroup and promises a faster way to compute the character tables of such groups. (Received September 10, 2007)