Title
Orthogonality relations for character and blocks

Abstract
It is well-known that the irreducible complex characters of a finite group satisfy certain orthogonality relations. For example the columns of the character table are pairwise orthogonal with respect to the usual Hermitian form on complex vector spaces. Now a block of a finite group can be seen as a distinguished set of irreducible characters. There are also orthogonal relations concerning the characters of blocks. In a recent work we showed that these relations can be refined further by making use of properties of algebraic integers. We apply these refined orthogonal relations in order to give an upper bound on the number of irreducible characters in a block in terms of local data. This is motivated by a long-standing and still open conjecture by Richard Brauer.