Meeting: 1003, Atlanta, Georgia, SS 8A, AMS Special Session on Modular Representation Theory of Finite and Algebraic Groups, I

1003-20-1657  Rishi Nath* (nath@math.uic.edu), Department of Mathematics, University of Illinois at Chicago, 851 South Morgan, Chicago, IL 60607. On Navarro’s Conjecture For The Alternating Groups, p=2.

The McKay conjecture asserts that if \( G \) is a finite group, \( p \) a prime, then \( \text{Irr}_{p'}(G) \), the set of complex irreducible characters of \( G \) of degree not divisible by \( p \), has the same cardinality as \( \text{Irr}_{p'}(N_G(P)) \), where \( P \) is a Sylow subgroup of \( G \).

Recently G. Navarro formulated the following refinement of the Mckay conjecture:

Let \( G \) be a finite group of order \( n \) and let \( p \) be a prime. Let \( e \) be any nonnegative integer and let \( \sigma \in \text{Gal}(Q_n/Q) \) be any Galois automorphism sending every \( p' \)-root of unity \( \alpha \) to a fixed power of \( p \), \( \alpha^{p^e} \). Then \( \sigma \) fixes the same number of characters in \( \text{Irr}_{p'}(G) \) and \( \text{Irr}_{p'}(N_G(P)) \).

In this paper we verify Navarro’s Conjecture for the case that \( G = A_n \) and \( p = 2 \). We adapt an argument by R. Carter and P. Fong to show directly that the Sylow 2-groups of \( A_n \) are self-normalizing. Combinatorial results of I.G. MacDonald are implemented in conjunction with some classical theorems of Frobenius. (Received October 06, 2004)