

Abstract Submitted  
for the APR15 Meeting of  
The American Physical Society

**Selection Rules for M1 and Gamow Teller transitions with a  $J=0$   $T=1$  pairing interaction** MATTHEW HARPER, LARRY ZAMICK, Rutgers Univ — We consider selection rules for M1 transitions in a single  $j$  shell with a  $J=0$   $T=1$  pairing interaction. We use  $J=1^+$  to  $J=2^+$  in  $^{46}\text{Ti}$  as an example. The states are classified as  $(v,T,t)$ -seniority- isospin and reduced isospin. We obtain vanishing  $B(M1)$ 's for 3 reasons. a.  $\Delta T=2$  b.  $\Delta v=4$  or 6 c. The final state differs from the initial state in both  $v$  and  $t$ . The first case a. is obvious because the M1 operator is of rank 1 in isospin. For case b. we note that the M1 operator acting on a  $J=0$   $v=0$  pair can only change  $v$  by 2 units. In c. the M1 operator cannot change both  $v$  and  $t$  at the same time. Examples of a. are  $(411)$  to  $(231)$ ,  $(231)$ . Examples of b. are  $(611)$  to  $(221)$ ,  $(211)$  Examples of c. are  $(611)$  to  $(412)$ ,  $(422)$ ;  $(220)$  to  $(412)$ ,  $(411)$ ,  $(422)$ ,  $(421)$ . Transitions in which the seniority changes by 2 units and the reduced isospin does not change are allowed. These selection rules also apply to corresponding Gamow-Teller transitions.

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Date submitted: 23 Nov 2014

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