Abstract Submitted
for the DNP06 Meeting of
The American Physical Society

The K quantum number in the Shell Model—^{50}Cr SHADOW ROBINSON, U. Southern Indiana, ALBERTO ESCUDEROS, LARRY ZAMICK, Rutgers U. — It was suggested [1,2] that the 10_1^+ state in ^{50}Cr at 6.340 MeV does not belong to the $K = 0^+$ g.s. band. In [1] it is noted that the static quadrupole moments of the $J = 2_1^+$–8_1^+ states are all negative, but that of 10_1^+ is positive. While Ref. [1] suggested that the 10_1^+ state belongs to a high K prolate band, in Ref. [2] they assign it as $K = 10^+$. There is a nearby second 10^+ state. However, the $B(E2)_{10_2^+ \to 10_1^+}$ was not quoted by either group. In this work, we performed full fp shell model calculations using four different interactions: FPD6, KB3, GXPF1, and GXPF1A. The results for $B(E2)_{10_2^+ \to 10_1^+}$ are robust around 135 e^2fm^4 and suggest strong K mixing. It is not clear what the K value for the 10_2^+ state is. With FPD6, $Q(10_2^+)$ is negative, suggesting it is a member of the $K = 0^+$ band. But it is hard to understand how to get strong mixing of $K = 0^+$ and $K = 10^+$. With the other interactions, $Q(10_2^+)$ is positive and thus inconsistent with a $K = 0^+$ (prolate) band. If we assume that the 10_1^+ state has $K = 10^+$ and the 8_1^+ state has $K = 0^+$, then the $B(E2)_{10_1^+ \to 8_1^+}$ would vanish. However, for the last three interactions, the corresponding $B(E2)$ is about 75 e^2fm^4, which implies substantial K mixing. Thus, while a $K = 10^+$ assignment for the 10_1^+ states makes the most sense in terms of energy systematics, in detail the situation is more complicated. [1] L. Zamick et al., Phys. Rev. C **53**, 188 (1996); Phys. Rev. C **54**, 956 (1996). [2] F. Brandolini et al., Phys. Rev. C **66**, 021302(R) (2002).

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Date submitted: 01 Jul 2006

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