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The nuclear structure of ^{32}P[1] CATUR WIBISONO, SAMUEL TABOR, VANDANA TRIPATHI, ELIZABETH RUBINO, CALEB BENETTI, ALEXANDER VOLYA, Florida State University — The ^{32}P nucleus was populated through two separate experiments at the FSU Fox Laboratory using ^{26}Mg(^{11}B, αn) and ^{18}O(^{16}O,pn) reactions both at E_{lab} = 30 MeV. Subsequent γ decays were observed with 3 or 4 Clover spectrometers. γ-γ coincidences were sorted into symmetric matrices and analyzed by projections. From the preliminary analysis using both data sets, several gamma ray transitions from the previous work as proposed by Chakrabarti *et. al*[2] can be confirmed, however some of gamma ray transitions proposed to populate the yrast $J^{\pi}=5^{-}$ state cannot be confirmed, as will be discussed. Furthermore, the observed states were then compared with the FSU *psdpf* shell model calculations[3]. The two highest level states from the previous work which were also observed in the present work agree relatively well with the FSU 2ph configurations suggesting that cross-shell excitation might have a role not only in describing the negative parity states for the nuclei in the *sd* shell, but also in describing the high spin positive parity states.

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[2]R. Chakrabarti *et al.*, PRC **84**, 054325 (2011).
[3]R. S. Lubna *et al.*, PRR **2**, 043342 (2020).

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